

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.



Ag 854 E
my

THE DEPARTMENT OF AGRICULTURE GRADUATE SCHOOL

EDUCATIONAL COURSES MAKING
FACILITIES AVAILABLE FOR
STUDY AND RESEARCH IN
THE GOVERNMENT SERVICE

1940-41

LIBRARY
RECEIVED

★ SEP 5 1940 ★

Department of Agriculture



WASHINGTON

CONTENTS

	Page
GENERAL INFORMATION.....	3
Accounting	5
Art Appreciation.....	28
Astronomy	23
Botany and Horticulture.....	6
Chemistry and Micro-Organic Analysis.....	6
Clerical and Secretarial.....	28
Economics	7
Editing	16
Engineering	20
English	17
Extension Education.....	19
General Lectures.....	30
Geography	27
Glass Blowing.....	20
G.P.O. Style Manual.....	17
Graphic Presentation.....	27
History	20
Languages	21
Literature and Drama.....	17
Management	22
Mathematical Preparation for Statistics.....	11
Meteorology	23
Mineralogy	23
Philosophy	24
Photography	28
Psychology and Sociology.....	24
Publications	30
Registration Form.....	31
Shorthand Development.....	29
Social and Legal.....	25
Soil Conservation.....	26
Soil Science.....	26
Speech	19
Statistics	13
Writing	18

THE DEPARTMENT OF AGRICULTURE GRADUATE SCHOOL

First Semester Begins September 23, 1940

Second Semester Begins January 27, 1941

Tuition is \$12 for two credit hours per semester, and \$18 for three credit hours per semester, except as otherwise indicated. Those who desire college or graduate credits certified to a university or to the Civil Service Commission will pay \$7.50 per credit hour. Students withdrawing from classes will not be entitled to refunds, except that if an announced course is not given for want of the minimum number of students (15), money paid will be returned in full.

Arrangements may be made at the time of registration for paying in two installments for which there will be an additional service charge of \$1.00 for each course, payable at the time of registration.

REGISTER IN ADVANCE. Registrations for the first semester should be completed before September 21st; for the second semester before January 24th.

Those desiring courses in subjects not included in this program should confer with others interested to see if there are enough applicants to make a self-supporting class. The minimum number required in most cases is fifteen, but special arrangements may be made with the approval of the instructors for the conduct of smaller classes.

Special series of lectures not included in this preliminary statement will be announced from time to time as plans for them are completed.

The latest catalogs of universities and colleges are available for consultation in the office of the Director. Inquiries regarding the school should be addressed to Dr. A. F. Woods, Director of the Graduate School, Room 1031 South Building, The Department of Agriculture, Washington.

Room assignments for classes may be obtained from the Director's Office after September 20th, or from the guards at the main entrances.

Any student working for academic credit should secure from the schools attended a transcript of his academic work and file it with the Secretary of the Graduate School, Mrs. Eva M. Johnson.

AUTHORITY AND OBJECTIVES

The Congress of the United States has authorized the use of facilities for study and research in the Government departments by qualified individuals, students, and graduates of institutions of learning in the several States and the District of Columbia under such rules and restrictions as the heads of departments and bureaus may prescribe (Joint Res. April 12, 1892, 27 Stat. 395; Deficiency Act of March 3, 1901, 31 Stat. 1010, 1039). Under this authority and the provisions of the Organic Act, a School of Graduate Studies was organized with the approval of the Secretary of Agriculture in 1921 for the benefit of Department employees and such others as are qualified to undertake the work offered.

Executive Order No. 7916 authorizes and directs "the establishment of federal training facilities in and by the Departments and Agencies and by the Civil Service Commission."

Some of the leading scientists in the Government departments are taking charge of courses and a few of the leading graduate institutions in and near Washington have furnished teachers for

others. The professional staffs of the various bureaus are mostly in the Civil Service and hold their positions by reason of merit. Most of them were originally drawn from the staffs of the leading colleges and universities, and are now practicing the subjects that they teach. Altogether a most helpful spirit has prevailed.

Because of the exceptional conditions under which the school operates, it has seemed neither necessary nor desirable to educators within and outside the Government that the school be included on the lists of accrediting associations. The work is of college grade for the levels indicated and is accepted by many of the leading universities when it meets the requirements of the program selected by the students. Graduate programs should be arranged in advance through the dean of the graduate school where the students desire to register for a degree. No courses are given in preparation for Civil Service examinations, but the Civil Service Commission accepts our credits in college subjects as part of the basic work required as prerequisites for taking examinations.

Information regarding administrative and teaching staff and history of the school is available upon request to the Director.

The Department Library in room 1052 will be open from 4:30 till 6 on Fridays for students who can not go there during the regular hours.

Social Science Reading Room

As an extension of the services of the Agricultural Economics Library, the Division of Statistical and Historical Research, in cooperation with the Graduate School, has opened a Social Science Reading Room in room 3906 South Building, for employees of the Department of Agriculture and students of the Graduate School. In addition to general books and periodicals in the field of Social Science, books for Graduate School students in the Social Science courses will be on reserve. The Reading Room will be open from 8:30 to 9:00 each morning and from 4:30 to 8:00 each evening, Monday through Friday. Books may be borrowed for overnight study. Admission is by card, which may be obtained from the Graduate School office, Room 1031 South Building.

OFFICE HOURS

Sept. 9 through June 15—9 a. m. to 5:45 p. m.;

Saturdays—9 a. m. to 1 p. m.

June 16 through Sept. 5—8:30 a. m. to 4 p. m.;

Saturdays—8:30 a. m. to 12:30 p. m.

SPECIAL NOTICE

All courses offered are subject to change to meet emergency needs of the preparedness program of the Government.

DETAILED DESCRIPTION OF COURSES

The asterisk (*) indicates cooperation with American University.
Roman numerals indicate college year levels.

ACCOUNTING¹

Students specializing in Accounting may obtain a special program sheet

Undergraduate

PRINCIPLES OF ACCOUNTING (II, 3 cr. each sem.)—Mr. Wm. H. Rowe, Dr. Oswald Nielsen, Dr. Allan J. Fisher, and Mr. G. Y. Jarvis. A two-hour LABORATORY PERIOD once a week is required unless specially excused by the instructor.

First semester work. Tues. and Thurs. at 5 commencing Sept. 24th. Laboratory, Tues. 6 to 8 commencing Oct. 1st. If enough persons register for two sections, the second section will be given Mon. and Wed. at 5 commencing Sept. 23d. Laboratory, Mon. 6 to 8 commencing Sept. 30th. Course repeated second semester. Mon. and Wed. at 5 commencing Feb. 3d. Laboratory, Mon. 6 to 8 commencing Feb. 10.

Elementary principles of accounting; discussion and problems. At the end of the semester students will be prepared to devise the accounting methods necessary for a small business organization, make the necessary entries in the records, draw up statements at the end of the fiscal year, adjust the accounts for accruals, deferred items, depreciation, etc., and close the books.

Second semester work. Tues. and Thurs. at 5 commencing Feb. 4th. Laboratory, Tues. 6 to 8 commencing Feb. 11th. This course will not be given during the fall semester unless 15 or more students register. If given, it will be on Tues. and Thurs. at 5 commencing Sept. 24th. Laboratory, Thurs. 6 to 8 commencing Oct. 3d.

Continuation of first semester covering the more advanced principles of accounting; account classifications; the valuation of assets and depreciation policies; manufacturing accounts; partnership accounts; and corporation accounting, particularly the treatment and interpretation of capital stock, surplus, and reserve accounts.

SECOND YEAR ACCOUNTING (III, 3 cr. each sem.)—Dr. Oswald Nielsen.

First semester. Fri. from 5 to 8 commencing Sept. 27th. Valuation, asset values, liabilities and net worth, allocation of income and expense to proper fiscal period as part of problem of valuation, deferring expenses and treatment of unusual losses and gains, profits and dividends, and the relationship of funds to reserves.

Prerequisite: First year accounting or equivalent.

Second semester. Fri. from 5 to 8 commencing Feb. 7th. Correction of financial statements and books of account, comparative statements and the analysis of financial statements by means of financial and operating ratios and statements of sources and application of funds, statements of affairs, receivers' accounts, realization and liquidation accounts, home office and branch accounting, and consolidated statements. Considerable emphasis will be given to the solution of problems in connection with such topics.

Prerequisite: First year accounting or equivalent.

Graduate and Advanced Undergraduate

***COST ACCOUNTING (IV, V, 3 cr.)**—Mr. Elmer C. Koch; Fri. from 5 to 8 commencing Sept. 27th. Given at American University. Fee \$22.50.

This course includes a thorough consideration of the basic principles of cost accounting together with their practical application in the development of cost accounting procedures. By means of lectures, study of a text, and the solution of problems, the student is familiarized with accounting for materials, labor, and indirect expenses; the relationship of cost accounts to the financial accounts; departmental, process, sequential, and job lot costs; and the uses of forms more commonly utilized in cost accounting. This is a one semester course.

Prerequisite: Principles of Accounting.

***AUDITING (IV, V, 3 cr.)**—Mr. Theodore B. Nickson; Wed. from 5 to 8 commencing Feb. 5th.

The purposes and types of audits will be studied. Consideration will be given to such problems as the planning and performing of audits, principles and auditing of different types of audits, audit working papers and reports, and responsibility of the auditor.

Prerequisite: Second year accounting.

¹ Additional courses in Accounting are listed in the American University catalog.

AUDITING PROCEDURE—(See CLERICAL AND SECRETARIAL.)

COMMODITY AUDITING AND ACCOUNTING (IV, V, 2 cr.)— Mr. John J. Bachmann; Thurs. from 5 to 7 commencing Sept. 26th.

This course will cover the field of commodity marketing, spot merchants, futures brokers, and processors; contract and other markets, rules, the Commodity Exchange Act; brokers, traders, correspondents, futures and spot houses, organization; records, spot houses, futures; segregation and commingling of funds; clearing houses; hedging; trade practices; delivery, visible supply, other supply factors; financial statements; audit reports; working papers; reports on 200-204 and related reports for other commodities; attitude of field auditor, conduct, ethics, preparation, and contacts.

ACCOUNTING IN THE FIELD OF LEGAL PROBLEMS—(See SOCIAL AND LEGAL.)

MATHEMATICS OF FINANCE (IV, V, 2-3 cr.)—Mr. Wm. H. Rowe. To be offered next year, 1941-42.

*INCOME TAX PROCEDURES (IV, V, 3 cr.)—Mr. John B. Payne. Given at American University. Fee \$22.50.

MUNICIPAL AND GOVERNMENTAL ACCOUNTING (IV, V, 3 cr.)—Mr. John B. Payne; Mon. from 5 to 8 commencing Feb. 3d.

A general survey of the scope and purpose of governmental accounting. The subjects discussed will include funds, classification of accounts, taxes, cash, and debt. Special attention will be given to financial reports. To the extent that time permits, reference will be made to Federal Accounting.

Prerequisites: One year of accounting or experience in fiscal administration.

BOTANY AND HORTICULTURE

Undergraduate

SYSTEMATIC BOTANY (II, 2 cr. each sem.)—Dr. S. F. Blake; Mon. and Wed. at 5 commencing Sept. 30th. Second semester, Jan. 27th.

This course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

Graduate and Advanced Undergraduate

HISTORY OF BOTANIC RESEARCH (IV, V, 2 cr. each sem.)—Dr. O. F. Cook; Tues. and Thurs. at 5 commencing Sept. 24th. Second semester, Feb. 4th.

A general survey of human interest in the plants of the world.

PLANT ECOLOGY (IV, V, 2 cr. each sem.)—Dr. M. B. Waite; Mon., Wed., and Fri. at 4:50 commencing Sept. 30th. Second semester, Jan. 27th. Each semester to run for ten weeks.

General plant ecology. The ecology of cultivated crop plants will be stressed.

Prerequisites: A general knowledge of botany and agriculture.

PLANT BREEDING WITH SPECIAL REFERENCE TO DISEASE RESISTANCE (V)—Dr. F. J. Stevenson. (Offered at two-year intervals; not due until 1942-43.)

Prerequisites: Bachelor's degree in botany or a related subject.

Courses in LANDSCAPE DESIGN will be available 1941-42.

PLANT BIOPHYSICS (IV, V, 2 cr. each sem.)—Dr. Glen A. Great- house; Thurs. at 5 commencing Oct. 3d. Second semester, Feb. 6th.

Course for advanced students and investigators. It will include the methods used to solve particular types of problems. The application of physics and chemistry to biological problems will be emphasized. A general outline of the proposed course may be secured from the Graduate School office.

PLANT PHYSIOLOGY (IV, V)—Dr. Glen A. Greathouse. Avail- able 1941-42.

CHEMISTRY AND MICRO-ORGANIC ANALYSIS

Undergraduate

GENERAL INORGANIC CHEMISTRY—Dr. E. P. Clark; Mon. from 5 to 7 commencing Sept. 30th. Fee \$12.

Designed for students whose work is not in the chemical field but who desire a general knowledge of the subject as an aid in reading and understanding other subjects in which chemistry plays a minor role. The

course will consist of lectures, amply demonstrated, covering the atomic and molecular theory; valence; the gas laws; chemical equations; oxidation and reduction; the periodic law; and a general consideration of the elements. After the completion of the foregoing material a brief introduction to the system employed in quantitative analysis will be presented. This course will not carry academic credit but a certificate will be awarded upon request for satisfactory completion of the course.

AN INTRODUCTION TO ORGANIC CHEMISTRY (II, 2 cr. each sem.)—Dr. E. P. Clark; Thurs. from 5 to 7 commencing Oct. 3d. Second semester, Feb. 6th.

The fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reactions, and structure will be considered. Historically important discoveries will be correlated with the development of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester will be devoted to the consideration of the aliphatic series; the second semester to the aromatic and heterocyclic series.

PHYSICAL CHEMISTRY (III, 2 cr. each sem.)—Dr. Walter J. Hamer; Tues. from 5 to 7 commencing Oct. 1st. Second semester, Feb. 4th.

Classification of matter; atomic and kinetic theories; atomic structure; valence and molecular structure; solutions; thermochemistry; the phase rule; chemical kinetics and thermodynamics; conduction by electrolytes.

Prerequisites: A year of college chemistry, with laboratory; a year of college physics; calculus.

Graduate and Advanced Undergraduate

ADVANCED ORGANIC CHEMISTRY (IV, V, 2 cr. each sem.)—Mr. C. Verne Bowen; Tues. from 5 to 7 commencing Oct. 1st. Second semester, Feb. 4th.

In this course fundamental reactions will be reviewed and elaborated. Newer developments in aliphatic and aromatic chemistry will be presented and recent progress in the chemistry of sterols, vitamins, and sex hormones will be given.

Prerequisites: A year of organic chemistry and a year of physics.

PHYSIOLOGICAL CHEMISTRY (IV, V, 2 cr. each sem.)—Dr. Herbert O. Calvery; Wed. from 5 to 7 commencing Oct. 2d. Second semester, Feb. 5th.

A lecture course on the principles of biochemistry. The course will deal with the chemistry of the proteins, fats, and carbohydrates; the general chemical composition of animal tissues, e.g., muscle, nerve, milk, and blood; a brief discussion of the enzymes of the gastro-intestinal tract; the digestion and absorption of the principal foodstuffs; metabolism of the proteins, fats, and carbohydrates; mineral metabolism; the chemical constituents of the urine; and finally a general discussion of the chemistry and physiology of the vitamins and hormones will conclude the course.

Prerequisites: One year general chemistry; one year organic.

SELECTED TOPICS IN CHEMICAL PHYSICS (IV, V, 2 cr. each sem.)—Dr. Alfred L. Sklar. Available in 1941-42.

ADVANCED INORGANIC ANALYTICAL CHEMISTRY (IV, V, 2 cr. each sem.)—Dr. James I. Hoffman. Available in 1941-42.

QUANTITATIVE MICRO-ORGANIC ANALYSIS (III, IV, 1 cr.)—Dr. E. P. Clark; Wed. at 5 commencing Feb. 5th. Fee \$6.

A lecture course covering the general principles of organic analysis with special emphasis upon micro- and semi-micro procedures. Consideration will be given the desirability of the several systems under various laboratory conditions, as well as the selection and fabrication of necessary apparatus for each. The lectures will be supplemented with demonstrations of equipment and manipulative procedure.

THERMODYNAMICS (IV, V, 2 cr. each sem.)—Dr. F. G. Brickwedde; Thurs. from 5 to 7 commencing Oct. 3d. Second semester, Feb. 6th.

The principles (1st and 2d laws) underlying the interconversion of heat and energy in other forms as mechanical, electrical, and chemical will be studied. From these principles the general equations of thermodynamics will be derived. The equations will be applied to the fields of chemistry, physics, and engineering in which the class is most interested. Subjects that may be considered are heat engines, refrigerating machines, equations of state and gases, temperature scale, thermochemistry, solutions, phase rule, law of mass action, radiation, quantum theory of specific heats, etc.

ECONOMICS

The courses in Economics are designed to meet the varied needs of Government employees, from the persons with no training in economics to those with a Doctor's degree. There are many persons well trained in other fields now engaged in work of an economic nature in the Department whose usefulness would be materially increased by taking Course 1. Others with undergraduate training in economics should consider starting their graduate training with Course 3. Persons with a year or more of graduate economics, taken some time ago, will find Course 26 helpful as a reorientation course in theory; it is primarily for 2d and 3d year graduate students in economics. Courses 27 and 28 are designed for persons who have had basic

training in general economic theory. Rapidly changing world political and economic conditions render Courses 5 and 6, 22, 29 and 30, and 31 especially significant at this time. Dr. Woods, Dr. Sarle and members of the staff will be glad to assist students in planning programs of study. For prerequisites in these courses consult the instructor.

Undergraduate

1. **PRINCIPLES OF ECONOMICS (III, 3 cr. each sem.)**—Dr. F. L. Thomsen; Mon. and Wed. from 5 to 6:30 commencing Sept. 23d. Second semester, Jan. 27th.

An examination of the nature, validity, and significance of the "fundamental principles of economics". Designed to give the student the understanding of basic concepts necessary for advanced study in the field of economics and for the better understanding of materials dealt with in applied courses. The relation between economic theory and scientific methods. The organization of the economic system: Production, consumption, exchange, and the distribution of income and wealth. The relation between economic institutions and so-called economic laws. What we know and do not know about the nature and causes of business cycles. International economic relations. Political economic "isms". Although the significance of basic principles will be interpreted in relation to current events and problems, the course is primarily designed to furnish an understanding of the scientific aspects of economics which have continuing application under changing world conditions.

2. **COTTON CLASSING (II, 2 cr.)**—Mr. R. L. Kause, in co-operation with the Cotton Division, Bureau of Agricultural Economics; a ten weeks' course held in the Cotton Division Laboratory on the sixth floor of the Annex Building, 12th and C Sts., S. W., from 4:30 to 5 daily and 1:30 to 3:30 on Saturdays, with permission to substitute the 8:30 to 9 a. m. period daily, commencing April 1st.

A study of grade, color, staple, and preparation. Registration limited to fifteen.

Graduate and Advanced Undergraduate

3. ***ECONOMIC THEORY (IV, V, 3 cr. each sem.)**—Dr. Howard S. Piquet. (See American University, School of Public Affairs catalog, Econ. 401-402.) Probably Thurs. 8:10 in Agr. Bldg. Audit fee \$22.50; credit fee \$30.

This course is designed to aid in meeting the requirements of candidates for the Master's degree in economics. It follows in general outline the more advanced presentation in 501-502. It is open to those who as undergraduates have had adequate preparation in economics.

4. **HISTORY OF ECONOMIC THOUGHT (IV, 2 cr. each sem.)**—Dr. Max J. Wasserman; Mon. and Wed. at 5 commencing Sept. 23d. Second semester, Jan. 27th.

An examination of the principal economic theories from Greek antiquity to the present time in the light of the institutions, customs, and practices which conditioned them.

Prerequisite: Consent of the instructor.

5. ***ECONOMICS OF INTERNATIONAL TRADE (IV, V, 3 cr.)**—Messrs. L. A. Wheeler and Robert B. Schwenger; Mon. and Wed. from 7:30 to 9 commencing Sept. 23d.

The object of this course is to present the basic elements in the theory of international trade and to reexamine them in connection with recent developments in both economic theory and the technique of Government control of trade. The course will consider such related questions as mechanism of international adjustment, foreign exchanges, and the balance of international payments.

6. ***CURRENT FOREIGN TRADE PROBLEMS AND POLICIES IN RELATION TO AGRICULTURE (IV, V, 3 cr.)**—Messrs. L. A. Wheeler, Robert B. Schwenger and Dr. L. Volin; Mon. and Wed. from 7:30 to 9 commencing Jan. 27th.

The object of this course is to present for discussion and analysis certain fundamental aspects of United States foreign-trade trends and policies and of the agricultural policies of foreign countries as they relate to United States agriculture.

7. ***SOCIAL AND ECONOMIC HISTORY OF AMERICAN AGRICULTURE (IV, V, 3 cr. each sem.)**—Mr. Everett E. Edwards; Tues. and Thurs. from 5 to 6:30 commencing Sept. 24th. Second semester, Jan. 28th.

First semester. Geographic factors; settlement of the English colonies along the Atlantic Coast; indigenous and foreign contributions to American agriculture, including Indian agriculture and Indian influence on agrarian migration, English agricultural practices, French influences, Spanish contributions; land systems and tenures in the English colonies; policies concerning the public domain, 1776-1862; agrarian settlement in America from the American Revolution to the Civil War; the westward expansion of agriculture to 1850; development of transportation facilities and home and foreign markets; the agrarian element in national politics to the Civil War.

Second semester. The agricultural revolution, its elements and significance; policies concerning the public domain since 1862; the westward movement of agrarian settlement since 1850; history and significance of

farm implements and machinery; agriculture since 1860 by regions and commodities; transportation and marketing agencies promoting agriculture, including individual leadership, societies, fairs, periodicals, State and Federal departments, education, and sciences; American agriculture during the first World War; postwar readjustments, including cooperation, tenancy, and rural population changes.

8. ***PRODUCTION ECONOMICS (IV, V, 3 cr.)**—Drs. Sherman E. Johnson and O. E. Goodsell; Mon. and Wed. from 7:30 to 9 commencing Sept. 23d.

This course is planned as an introduction to the course in farm management to be offered the second semester. It stresses the principles basic to the economic problems of production which are encountered in farm management, land economics, soil conservation, and similar fields. It is aimed at an understanding of the economic basis of agricultural production and the development of principles of production economics and farm accounting as useful tools in analysis of problems with which the student is concerned.

Prerequisite: Principles of economics or its equivalent.

9. ***FARM MANAGEMENT (IV, V, 3 cr.)**—Drs. Sherman E. Johnson and O. E. Goodsell; Mon. and Wed. from 7:30 to 9 commencing Jan. 27th.

This course considers the most economic combination of resources used in farming, the combination of farm enterprises and their efficient operation on individual farms, and the basis for formulation of farming programs for agricultural areas.

Prerequisite: Production economics or its equivalent.

10. ***PRINCIPLES OF AGRICULTURAL FINANCE (IV, V, 3 cr.)**—Drs. Donald C. Horton and Fred L. Garlock; Mon. and Wed. from 5 to 6:30 commencing Sept. 23d.

The use of credit in different types of agriculture and the mechanism through which credit is supplied to farmers. The course will analyze the evolution of farmers' credit needs, farm credit institutions, the measures undertaken to reduce credit costs, and the relationship of the farm debt to changing conditions in agriculture. The role of credit in land-use planning and the rehabilitation of low-income farmers will be given special attention.

11. ***ECONOMICS OF COOPERATIVE ORGANIZATION (IV, V, 2 cr.)**—Drs. T. G. Stitts, W. W. Fetrow, and Mr. Harold Hedges; Mon. from 5 to 7 commencing Jan. 27th.

This course deals with the history, philosophy, and economic concepts of the cooperative movement and with practical operating problems of farmers' cooperatives. The group will consider such questions as: What factors make cooperative associations different from other forms of business enterprise? What are the legal bases of cooperation? What are the most effective ways of handling problems of organization structure? Of membership? Of finance? How many farmers best use cooperative principles to improve their economic status? What limitations must be observed?

Throughout the course, the place of cooperatives in relation to the handling of particular commodities will be analyzed. There will also be discussion of specific problems concerned with the marketing of farm products and the purchasing of farm supplies.

12. ***ACTION PROGRAMS OF THE DEPARTMENT (IV, V, 2 cr.)**—Mr. Oris V. Wells; Tues. from 5 to 7 commencing Sept. 24th.

A survey course in which the development, functioning, and social and economic implications of such programs as Agricultural Adjustment, Farm Security, Surplus Commodities, and Soil Conservation will be considered.

13. ***PRINCIPLES OF LAND APPRAISAL (IV, V, 2 cr.)**—Dr. P. L. Gaddis; Tues. from 5 to 7 commencing Jan. 28th.

An application of the economics of land value to the practical problems of land appraisal.

14. ***PRINCIPLES OF INSURANCE (IV, V, 3 cr.)**—Dr. Allan J. Fisher; Tues. and Thurs. from 7:30 to 9 commencing Sept. 24th.

A survey of the field of insurance, including farm insurance. The major fields embrace life, fire, marine, crop, casualty and miscellaneous coverages, and social insurance. The subject matter includes the theory of insurance, the insurance contract, types of insurance carriers, rate making, loss adjustment, insurance reserves, State regulation and supervision. Stress is placed upon the economic and social implications of the subject.

15. ***COTTON MARKETING (IV, V, 3 cr.)**—Dr. John W. Wright and specialists in cotton marketing; Tues. and Thurs. from 7:30 to 9 commencing Jan. 28th.

Although primary emphasis will be placed on the marketing system for raw cotton and its functioning through all stages of the distributive process from sale by producers to purchase by spinners and related problems, the course will cover also the manufacturing processes and the organization of the cotton textile industry, the system of distribution of manufactured cotton goods, and the general situation with respect to cotton in the present world economy.

Prerequisites: At least one course in general economic theory and preferably a general course in marketing.

16. ***THE ECONOMIES OF THE NATIONS OF LATIN AMERICA (IV, V, 3 cr. each sem.)**—Dr. Charles F. Sarle; Tues. and Thurs. 5 to 6:30, commencing September 24th.

A study of the economic organization and trade of the countries of Latin America, the relationship of the economies of these nations among themselves, with the United States, Europe, and Asia. Special lecturers will discuss physical and cultural bases of these economies, including geography, climate, soils, agricultural, mineral, and water power resources, as well as economic institutions. Students will report on special economic assignments including development of constructive programs designed to contribute to economic solidarity of the Americas.

17. ***HISTORY AND DEVELOPMENT OF PRICE POLICIES (IV, V, 2 cr.)**—Dr. Richard A. Kahn; Tues. from 7:30 to 9:30 commencing Sept. 24th.

Covers the historical development of governmental interference with price movements as fixation of maximum or minimum or average prices. Study of the price policies of public or semi-public syndicates and trusts and the governmental determination of private price fixing.

18. ***MONEY AND BANKING (IV, V, 3 cr.) (fall sem.)**—Mr. Homer Jones. (See American University catalog, Econ.-410.) Audit fee \$22.50; credit fee \$30.

19. ***TAXATION AND PUBLIC FINANCE (IV, V, 3 cr.) (spring sem.)**—Dr. Fritz Karl Mann. (See American University catalog, Econ.-430.) Audit fee \$22.50; credit fee \$30.

20. ***THE WORLD CRISIS AND THE HANDLING OF NATIONAL RESOURCES (IV, V, 3 cr.) (fall sem.)**—Dr. Rudolf Clemen. (See American University catalog, Econ.-460.) Audit fee \$22.50; credit fee \$30.

21. ***THE GEOGRAPHY OF NATIONAL DEFENSE (IV, V, 3 cr.) (spring sem.)**—Dr. M. J. Proudfoot. (See American University catalog, Econ.-467.) Audit fee \$22.50; credit fee \$30.

22. ***ORGANIZED LABOR AND THE LAW (IV, V, 3 cr.)**—Dr. David Ziskind; Mon. 7:30 to 10:30 commencing Sept. 23d.

This course is designed to develop an understanding of the functioning of law and Government agencies in the field of labor relations. It will present an analysis of court actions and judicial decisions on the organization of trade unions, the incidents of union membership, collective bargaining, strikes and lockouts, picketing, boycotts, blacklists, conciliation and arbitration, and trade union responsibility.

23. ***THE INDIVIDUAL WORKER AND THE LAW (IV, V, 3 cr.)**—Dr. David Ziskind; Mon. 7:30 to 10:30 commencing Jan. 27th.

The progress of social legislation designed to improve labor standards. Legislation on child and woman labor, safety and health, accident compensation, wage payment and collection, minimum wages, unemployment insurance, and old age pensions. The administrative procedures before such agencies as the National Labor Relations Board, the Social Security Board, the National Mediation Board, the Division of Public Contracts, the Fair Labor Standards Division, and the various State labor departments.

24. **UNITY IN THE LABOR MOVEMENT (IV, V, 3 cr.)**—Dr. David Ziskind; Wed. 6 to 9 commencing Oct. 2d.

This course will consider the internal struggles and harmonious adjustments in the labor movement. It will deal with craft and industrial unionism, dual unionism, jurisdictional disputes, amalgamations, and other forms of cooperation. It will review the historical antecedents for possible unity between the A.F. of L. and the C.I.O. (Seminar and discussion.)

25. **THE PROBLEM OF UNEMPLOYMENT (IV, V, 3 cr.)**—Dr. David Ziskind; Wed. from 6 to 9 commencing Feb. 5th.

The analysis of unemployment primarily as it has manifested itself in this country during the past several years. An evaluation of the efforts to overcome the causes and effects of unemployment. (Seminar and discussion.)

Graduate

26. ***CONTEMPORARY ECONOMIC THOUGHT (Advanced Economic Theory) (V, 3 cr. each sem.)**—Dr. Howard S. Piquet. (See American University catalog, Econ.-501-502.) Probably Thurs. 5 to 7:30. Audit fee \$22.50; credit fee \$30.

27. ***ECONOMICS OF CONSUMPTION (V, 3 cr.)**—Dr. Michael T. Wermel; Mon. and Wed. 7:30 to 9 commencing Sept. 23d.

A study of consumer demand and its special significance to economic theory. This course will offer a comprehensive analysis of economic demand—the factors determining consumer choices. The various planes of consumption standards of living, etc. Analyses of commercial, professional, and governmental agencies affecting the consumer and his choices. Organization of consumers. Analysis of the legal position of the consumer. The protection of the consumer. Particular attention will be paid to the significance of consumer choice and consumer standards of living to agriculture.

28. ***ECONOMICS OF IMPERFECT COMPETITION** (V, 3 cr.)—Dr. Michael T. Wermel; Mon. and Wed. from 7:30 to 9 commencing Jan. 27th.

This course will commence with a critical re-examination of the basic premises underlying the traditional theory of price determination, as an introduction to an intensive study of the newer theoretical techniques, developed during recent years, for the analysis of prices under conditions which fit neither the assumptions of "perfect competition" nor of "pure monopoly" and which have been described as conditions of "monopolistic" or "imperfect competition." (Joan Robinson—*The Economics of Imperfect Competition*; Edward Chamberlin—*The Theory of Monopolistic Competition*.) The usefulness and applicability of this theoretical apparatus will be tested by a study of actual institutional practices, of price determination in specific markets, where admittedly neither "perfect competition" nor "pure monopoly" prevail. (A. R. Burns—*The Decline of Competition*; Walton Hamilton and Associates—*Price and Price Policies*.)

29. ***FORECASTING DEMAND FOR AGRICULTURAL PRODUCTS** (V, 3 cr.)—Dr. F. L. Thomsen; Tues. and Thurs. from 5 to 6:30 commencing Sept. 24th.

An analysis of the relative importance of changes in demand and supply as affecting prices of farm products. The meaning and measurement of "demand," and of changes in demand. The influence of domestic and foreign factors responsible for changes in demand. Consumer demand and dealer demand. Demand in the cash and futures markets. The factors affecting consumer demand and consumer purchasing power. Movements of the general price level and related conditions. Business cycles. A considerable portion of the course will be devoted to the forecasting of industrial activity and related demand conditions. Exchange rates and other factors related to export demand for United States farm products.

30. ***AGRICULTURAL PRICE ANALYSIS** (V, 3 cr.)—Dr. F. L. Thomsen; Tues. and Thurs. from 5 to 6:30 commencing Jan. 28th.

A review of the supply and demand factors affecting agricultural prices. Time elements in prices. Research methods and materials in price analysis. Index numbers. Uses and limitations of multiple correlation in price analysis. Seasonal variation. Trends and cycles. A critical evaluation of progress to date in price analysis. Price forecasting. Chart reading. The use of analytical devices in throwing light upon the probable effects of agricultural legislation designed to influence farm prices and income, and in promoting the successful administration of such measures.

31. ***SEMINAR: AGRICULTURE UNDER CHANGING WORLD CONDITIONS** (V, 2 cr. each sem.)—Dr. O. C. Stine; Thurs. from 7:30 to 9:30 commencing Sept. 26th. Second semester, Jan. 30th.

The problems will include current economic problems arising in connection with agricultural programs and the World War and probable post-war conditions. Each student will be expected to select at least one major problem with reference to which he will specialize for one semester or for the year. He will be expected to read extensively and present occasional reports to the seminar. The field of problems to be covered in the course of the year will be determined largely by the special interests of the students.

Prerequisite: 15 semester hours in economics or equivalent.

THE FUNDAMENTAL PRINCIPLES OF INTERNATIONAL LAW AND RELATIONS—(See SOCIAL AND LEGAL.)

Courses to be offered in 1941-42

32. ***ECONOMIC PROBLEMS IN AGRICULTURAL PROGRAM PLANNING** (IV, V, 3 cr.)—Dr. Bushrod W. Allin and Mr. D. A. Fitzgerald; fall 1941.
33. ***ECONOMIC PROBLEMS IN REGIONAL AND LOCAL PLANNING** (IV, V, 3 cr.)—Dr. Bushrod W. Allin and associates; spring 1942.
34. ***THEORY AND PRINCIPLES OF AGRICULTURAL MARKETING** (V, 3 cr. each sem.)—Drs. F. V. Waugh, A. C. Hoffman, and Mr. R. O. Been.

MATHEMATICAL PREPARATION FOR STATISTICS

(Courses not available this year are shown by title only.)

The mathematics courses are under the general supervision of Dr. W. Edwards Deming. The Director, or any of the instructors will be glad to assist students in formulating a program of study.

Undergraduate

PRACTICAL ARITHMETIC—Mr. Albert J. Mattern; Thurs. from 5 to 7 commencing Sept. 26th. Offered every year, in the fall semester only. Fee \$12.

Short-cut methods and checking procedures. Computing percentages, ratios, decimal equivalents, interest and discount, loan repayment schedules. Specific problems brought in by members of the class are treated. This is not a credit course but is intended to improve performance in accounting, statistical, and secretarial work.

No prerequisites.

1. **ALGEBRA (I, 3 cr.)**—Mr. Harry J. Winslow; Tues. and Thurs. from 5 to 6:45 with an intermission, commencing Sept. 24th. Offered every year, in the fall semester only.

The fundamental rules of algebra; exponents; logarithms; proportion, manipulation with proportions; identities and conditions; solution of equations; binomial theorem, numerical approximations. Symbols of operations. Determinants; solution of equations by the reciprocal matrix. Some theory of equations. Progressions; series. Permutations and combinations. Graphical methods.

Prerequisites: High school algebra, plane and solid geometry.

2. **TRIGONOMETRY AND ANALYTIC GEOMETRY (I, 3 cr.)**—Mr. Harry J. Winslow; Tues. and Thurs. from 5 to 6:45 commencing Feb. 4th. Offered every year, in the spring semester only.

Definitions in trigonometry; identities; complex numbers; DeMoivre's theorem; trigonometric equations. The study of analytic geometry will include the line, conic sections, and some other plane curves, polar coordinates families of curves with one or more parameters. Parametric equations of curves. Radical axis. Graphic solution of equations. Some three-dimensional geometry.

Prerequisite: Mathematics 1 or equivalent.

- 3, 4. **CALCULUS (II)**—Dr. W. Edwards Deming. Offered in alternate years; due again in 1941-42.

5. **HIGHER ALGEBRA (III)**—Dr. E. J. Finan; offered in alternate years; due again in 1941-42.

6. **COORDINATE GEOMETRY AND VECTORS (III)**—Dr. S. B. Littauer; offered in alternate years; due again in 1941-42.

Graduate and Advanced Undergraduate

- 7, 8. **ADVANCED CALCULUS (IV)**—Not offered this year.

9. **THE MATHEMATICS OF INVESTMENT (V, 2 cr.)**—Messrs. Dorrance C. Bronson, F.A.S., and Eugene Rasor; Fri. from 5 to 6:45 commencing Nov. 15th and ending in March. Offered this and every third year.

The object is to provide training for various insurance programs, also directed study for students of actuarial science. Interest and discount functions, annuities-certain, valuation of mortgages, debentures, and other securities; loans repayable by cumulative sinking funds. Determination of bond yield and rate of interest. Application of the finite and infinitesimal calculus to interest problems required for graduate credit. Text: Ralph Todhunter—*Compound Interest and Annuities-Certain* (the text recommended for part 4 of the actuarial examinations).

Prerequisites: A year of college mathematics; also calculus for students taking the course for graduate credit. (A more elementary course is listed under ACCOUNTING.)

- 11, 12. **ANALYTIC MECHANICS (V)**—Dr. F. G. Brickwedde. Offered in alternate years; due again in 1941-42.

14. **INTERPOLATION AND FINITE DIFFERENCES (V)**—Dr. W. Edwards Deming. Offered every four years; due again in 1941-42.

- 15, 16. **DIFFERENTIAL EQUATIONS (V)**—Offered every fourth year; due again in 1941-42.

- 17, 18. **LINEAR ALGEBRA (V, 2 cr. each sem.)**—Mr. M. A. Girshick; Mon. from 5 to 7 commencing Sept. 30th. Second semester, Jan. 31st. Offered every third year. (This course is a prerequisite for statistics courses 29, 30, 31.)

Determinants. Theory of linear dependence. Linear equations, homogeneous and non-homogeneous. Matrix algebra; calculation of the inverse matrix, application to linear equations. Linear transformations. Quadratic forms; the matrix and discriminant; reduction of a quadratic form to a sum of squares; characteristic equation; definite and indefinite forms. Pairs of quadratic forms, reduction to normal form. Properties of polynomials. Invariants, covariants, half-invariants, annihilators; canonical formation of binary cubics and quadratics. Symmetric functions. Elementary divisors.

Prerequisite: College algebra.

- 19, 20. **THE THEORY OF INFINITE PROCESS (V)**—Dr. C. Winston. Offered every third year; due again in 1942-43.

- 21, 22. **THE THEORY OF FUNCTIONS (V, 2 cr. each sem.)**—Dr. C. Winston; Tues. from 7 to 9 commencing Oct. 1st. Second semester, Feb. 4th. Offered every fourth year. (This course is a prerequisite for the course in the Characteristic Function, Statistics 33, 34, to be offered next year.)

Theorems on limits. Continuous and discontinuous functions. The derivative. Expansion of functions in power series. Riemann integration. Some point set theory and extensions of integration. Functions defined by series and by integrals. Differentiation and integration of series. Differentiation of integrals. Classification of functions. Line, surface, and volume integrals. Greene's theorem. Mapping; transformations. Contour integration. Some Fourier series and the Legendre polynomials. The Bernoulli

and Euler numbers. The Bernoulli summations. The Euler-Maclaurin summation. The Gauss formula for quadrature. The Fourier integral. The complete and incomplete Gamma and Beta functions. Incomplete summation of the binomial expansion. Elliptic functions and integrals.
Prerequisite: Calculus.

23. SELECTED TOPICS FROM THE HISTORY AND PHILOSOPHY OF MATHEMATICS (V, 2 cr.)—Prof. Tobias Dantzig; Wed. from 7 to 9, commencing Oct. 2d.

History of the infinite processes with emphasis on the evolution of the number concept. History of linear and quadratic forms with special emphasis on the evolution of the space concept, non-Euclidean geometry and theory of relativity. History of maxima and minima and of the calculus of variations with special emphasis on the development of such principles as conservation, stability and economy, least action, etc., in the study of physics.

Prerequisites: Algebra, analytic geometry, calculus.

STATISTICS

The statistical courses are under the general supervision of
Dr. W. Edwards Deming.

PREFATORY NOTE

In conjunction with formal courses in statistics, the student is earnestly urged to pursue studies in some branch of science and in philosophy; such adjuncts constitute intangible prerequisites to progress in statistical inference. Mathematics in various degrees, both as a tool and as a mode of thought, is indispensable to the study of statistics, and it is a rule that students working for credit in any course must come prepared with the stated mathematical prerequisites; however, for students who wish to learn the routine of certain statistical calculations, certain courses below are offered without mathematical requirements. It should be borne in mind that any course, statistical or otherwise, necessarily receives its character from the instructor; wherefore students planning to undertake work in statistics are advised to look forward to a well-rounded program, not to be curtailed until a number of points of view have been acquired. The Director and other members of the staff will be glad to assist students in drawing up programs of study.

SEMINARS IN STATISTICS. Meetings are held twice monthly under the direction of Dr. Deming. Membership is limited to people who can contribute original work or surveys of journal articles. This is not a credit course, and no fee is charged. Applications should be sent in writing to the Director.

Undergraduate

1, 2. GRAPHIC METHODS APPLIED TO RESEARCH ANALYSIS (I, 2 cr. each sem.)—Mr. R. G. Hainsworth; Tues. and Thurs. from 5 to 7 commencing Sept. 24th. Second semester, Jan. 28th.

First semester. Charts and diagrams; general discussion of the major groups and the breakdown into their various classes, forms and types. General chart interpretation. Actual working examples of time series, frequency diagrams, and other forms of illustrations. Applications of the pictorial aspect to charting. Prevailing and suggestive examples of chart standardization and preparation of data for graphic presentation.

Second semester. Maps: how to interpret them; when and how to use them; their preparation and adaptability; examples of data as applied to statistical and geographical maps. Actual working examples of multiple dot, circle, pie diagram, cross hatch, line, basic outline, and typographic and physiographic types will be given.

No prerequisites.

3. INTRODUCTION TO STATISTICAL ANALYSIS, 1st half.

SECTION A. (I, 2 or 3 cr.)—Dr. O. A. Pope; Mon. from 5 to 7, commencing Nov. 11th, and ending in March.

An additional seminar will be held Thursdays at 3 o'clock for consideration of special research problems; this seminar is optional, giving one additional credit to those who complete the assignments. The course is for students of the plant and animal sciences who wish an introduction to the newer experimental designs and the proper analyses. It is non-mathematical and is designed particularly as a forerunner to Dr. Brandt's course (No. 15). The topics are randomized blocks, Latin squares, factorial designs, and pseudo-factorial designs.

There are no mathematical prerequisites.

SECTION B (I, 2 cr.)—Dr. Richard O. Lang; Thurs. from 5 to 7 commencing Sept. 26th.

This is a non-mathematical elementary course designed for statistical clerks who wish to become familiar with the more common statistical terms and formulas, and who wish to learn how to lay out the forms for machine calculations. Methods of checking calculations will be emphasized. The course will include the presentation of data and the results of calculations in tables and charts.

No prerequisites. (See NOTE on next page.)

SECTION C (II, 2 cr.)—Dr. Solomon Kullback; Tues. and Thurs. at 5 commencing Sept. 26th.

This is designed for students of business and economics. The collecting of economic and census data; the presentation of data in tables and graphs; different kinds of averages; measures and significances of dispersion; elementary principles of sampling; introduction to index numbers and time series. Attention will be paid to the preparation of formulas for machine calculations.

Prerequisites: Mathematics 1 and 2. (See *NOTE below.*)

SECTION D (II, 2 cr.)—Mr. Sidney Wilcox; Mon. and Wed. at 5 commencing Sept. 25th.

The topics and purpose will be the same as those of Section C, and with the same prerequisites.

SECTION E (II, 2 cr.)—Mr. Richard J. Foote; Wed. and Fri., at 5, commencing Jan. 31st.

The topics, purpose, and prerequisites are the same as for Sections C and D, the only distinction being that the sessions of Section E will be held in the Spring semester.

NOTE. There is necessarily a considerable amount of calculation in the work of Sections B, C, D, and E. Students who do not have access to a calculating machine, or who require training in the operation of such machines, should register also in Course 5, MACHINE CALCULATION.

4. INTRODUCTION TO STATISTICAL ANALYSIS, 2d half.

SECTION B (I, 2 cr.)—Dr. Richard O. Lang; Thurs. from 5 to 7 commencing Jan. 30th.

Non-mathematical—a continuation of Course 3, Section B. Problems in the relations between two variables; association, correlation, and regression. Some elementary aspects of sampling.

SECTION C (II, 2 cr.)—Dr. Solomon Kullback; Tues. and Thurs. at 5 commencing Jan. 30th.

This is a continuation of Course 3, Section C. Problems in the relations between two or more variables. Association, correlation, and regression, leading into multiple and partial correlation. Introduction to the analysis of variance and its relation to correlation. The presentation of data. Formulas will be put into form for machine calculation.

Prerequisite: Statistics 3, mathematics 1 and 2. (See *NOTE above.*)

SECTION D (II, 2 cr.)—Mr. Sidney Wilcox; Mon. and Wed. at 5 commencing Jan. 27th.

This is a continuation of Course 3, Section D. The topics are the same as those of Section C. Same prerequisites.

SECTION E (II, 2 cr.)—Mr. Richard J. Foote; Wed. and Fri. at 5 commencing Sept. 25th.

This is a continuation of Course 3, Sections C, D, and E, and differs from the Sections C and D of Course 4 only in that the sessions of this section are held in the fall semester. Prerequisites the same as those listed for Section C.

5. MACHINE CALCULATION (II, 1 cr.)—Mr. Robert Steffes; Thurs. from 7 to 9 commencing Oct. 3d, and Feb. 6th. Fee \$9; registration limited. This is a one semester course, repeated in the spring.

Simple operations on different kinds of calculators; treatment of decimal points; extraction of roots, cumulative moment processes with tape machines; short-cuts and checks; adaption of formulas to machine calculation.

Prerequisites: High school algebra and statistical experience.

6. STATISTICAL APPLICATIONS OF TABULATING EQUIPMENT (II, 1 cr.)—Instructor to be announced; Wed. from 7 to 9 commencing Feb. 5th. Offered in the spring semester only. Fee \$9.

The punch card method. The functions of the principal machines. The instruction will not cover the actual operation and wiring of tabulating equipment, but rather the theory of their use in statistical work. The use of cards to obtain sums of squares and cross-products in correlation and curve-fitting will be studied.

7. INDEX NUMBERS AND TIME SERIES (III, 2 cr.)—Mr. C. M. Purves; Wed. and Fri. at 5 commencing Sept. 25th. Offered in the fall semester only.

The theory of index number construction, the problem of sampling, and the methods of weighing various types of index numbers are taken up in this course and an analysis is made of the more commonly used index numbers of prices, production, and trade statistics. The analysis of time series includes a review of the methods of measuring the components of the series, and the application of these methods to specific problems.

Prerequisites: Statistics 1, 2, and 5.

8. CORRELATION ANALYSIS (III, 2 cr.)—Mr. C. M. Purves; Wed. and Fri. at 5 commencing Feb. 5th. Offered in the spring semester only.

The application of advanced correlation methods to practical problems, particularly those involving time series. Various methods including mathematical and freehand multiple curvilinear correlations, use of logarithms and first differences and joint correlation will be applied to specific problems.

Emphasis will be placed upon the limitations of correlation in analyzing problems including time series, and the tests of significance of results obtained.

Prerequisites: Statistics 1, 2, and 5.

Graduate and Advanced Undergraduate

- 9, 10. **GRAPHIC CORRELATION (IV, 2 cr. each sem.)**—Mr. Louis H. Bean; Mon. from 5 to 7 commencing Sept. 30th. Second semester, Feb. 3d.

Theoretical examples of graphic correlation, followed by practical applications in economics and other fields. The distinctions between the formal mathematical method, the formal graphical method (Ezekiel), and the short-cut method (Bean). Problems concerning the number of variables of inter-correlation, and other aspects of the adequacy and reliability of results.

Prerequisites: High school algebra; a first course in statistics or practical experience.

- 11, 12. **INTERMEDIATE STATISTICS (IV, V, 2 cr. each sem.)**—Dr. William G. Madow; Thurs. from 5 to 7 commencing Sept. 26th. Second semester, Jan. 30th.

First semester. Mathematical expectation. Bernouilli and Poisson distributions, Tchebycheff inequality and the first law of large numbers. Fourier transform; moment generating function. The second law of large numbers. The distribution of quadratic forms. Likelihood. A discussion of various statistical tests. Extra work will be provided for graduate credit.

Second semester. The distribution of correlation coefficients. The tetrad difference. Factor analysis (Hotelling, Thurstone, Holzinger). The sampling theory of roots of determinantal equations. Canonical correlation. Discriminant functions. Rank correlation.

Prerequisites: Calculus, and introductory statistics.

14. **THEORY OF PROBABILITY (IV)**—Mr. M. A. Girshick; offered every three years. Due again in 1942-43.

15. **STATISTICAL TREATMENT OF EXPERIMENTS IN THE PLANT AND ANIMAL INDUSTRIES (V, 2 or 3 cr.)**—Dr. A. E. Brandt; Tues. from 5 to 7 commencing Nov. 12th and ending in March.

Special emphasis will be placed on the design of experiments, and the statistical analysis of the observations. The concept of independent comparisons or individual degrees of freedom will be used. The principles of the design of experiments and the analyses proper thereto will be emphasized. Randomized blocks, Latin squares, factorial and pseudo-factorial designs will be discussed in detail; also confounding and partial confounding; examination of methods of analyzing data from experiments involving these methods. A seminar supplementing the lectures will be held on Fridays at 3 o'clock at which specific problems relating to research of interest to class members will be discussed. One hour additional credit will be given to those who carry out the special reading and calculations to be advised.

Prerequisite: High school algebra. Opportunities will be provided in the use of more mathematics for those who are qualified. Course 3, Section A, is designed as a forerunner to this course.

16. **ELEMENTARY STATISTICAL METHODS IN BIOLOGY AND AGRICULTURE (Correspondence course for field workers)**—Conducted by Dr. F. M. Wadley, Bureau of Entomology and Plant Quarantine. Fee \$15. Registration will be open beginning Oct. 1st; work may be begun at any time during the year unless the class becomes full.

This course uses Snedecor's textbook, *Statistical Methods* and follows its outline largely but not absolutely. Each of the 15 lessons consists of a discussion, a textbook assignment, and a series of questions and problems. The student reports on these, and also may discuss individual problems. The reports are returned with corrections and comments. Subjects discussed include simple variation, regression and correlation, analysis of variance and covariance, chi-square, multiple and curvilinear correlation, applications to sampling and experimental design. Practical application of methods is kept to the front. Facility in the use of arithmetic and simple algebra is necessary. Write for special information circular. A limited number of registrations can be accommodated.

- 17, 18. **THE INTERPRETATION OF STATISTICAL CALCULATIONS (V, 2 cr. each sem.)**—Mr. Alexander Sturges; Mon. from 5 to 7 commencing Sept. 30th. Second semester, Feb. 3d.

First semester. The philosophy and assumptions involved in statistical inference from sampling data. The conditions of sampling will be stated and compared with practical situations. The effect of failure to meet the ideal conditions will be studied. Methods will be offered for deciding whether the sampling conditions depart too far from the ideal.

Second semester. The selection and use of statistical tests. The illustrative problems will deal with single and multiple attributes. Time series will be discussed in the light of some new methods.

Prerequisites: Statistics 3 and 4, Mathematics 1 and 2.

- 19, 20. **ADJUSTMENT OF OBSERVATIONS (V, 3 cr. each sem.)**—Dr. W. Edwards Deming; Thurs. from 7 to 10 commencing Oct. 3d. Second semester, Feb. 6th. Offered every four years.

First semester. An introduction to some elementary mathematical developments used in statistics. Moments of distribution curves and frequency polygons; Sheppard's corrections. The complete and incomplete

Gamma and Beta functions. Approximations to limits; the Euler-Maclauren summation formula. Theory of sampling from two or more categories. The incomplete summations of the point binomial and the Poisson limit. The Tchebycheff inequality. History.

Second semester. An introduction to statistical inference. The necessity for sampling. The theory of errors. Real sampling and mathematical sampling. Likelihood, confidence intervals, Bayes' rule and Laplace's extension. Shewhart's criterion of randomness. Statistical control. The interpretation of sampling data; common impediments to the application of statistical theory. Special attention to the operational definitions of Shewhart, his criterion of meaning, his rules for the presentation of data, and his methods of quality control. The consumer-purchase risk. Distinction between prediction and "estimation."

Prerequisites: Calculus and two introductory courses in statistics, or the equivalent.

21. LEAST SQUARES (V)—Dr. W. Edwards Deming; offered every four years. Due the fall semester of 1941-42.

23. THE THEORY OF SAMPLING (V, 2 cr. each sem.)—Messrs. J. Cornfield and W. D. Evans; Tues. from 5 to 7 commencing Oct. 1st. Offered every two years.

The necessity for sampling. The planning of surveys to achieve maximum efficiency. The course is designed to provide general methods which may be applied to a large variety of sampling situations. The fundamental theorems on sampling error will be developed. Stratification; sampling units; sampling from finite populations; double sampling; form of estimate; design of samples to minimize the probability of error in estimating means, ratios, percentiles, distributions, regressions.

Prerequisites: Mathematics 3, and statistics 3 and 4, or equivalent.

26. SAMPLING METHODS IN SOCIAL AND ECONOMIC DATA (V, 2 cr. each sem.)—Messrs. J. Stevens Stock and Lester R. Frankel; Tues. from 5 to 7 commencing Feb. 4th. Offered every two years.

Theory, history, and present day applications of the representative method. Accuracy and precision. Fallacies of the total count. Practical problems involved in these selections of the sample. Sampling without replacement. The analysis of variance in making estimates of precision. Choice of sampling units. Stratification; principal components.

Prerequisites: Mathematics 1, statistics 3, 4, 8, or equivalent. Calculus required for graduate credit.

27, 28. STATISTICAL METHODS FOR RESEARCH WORKERS (V, 2 cr.)—Dr. Wm. G. Madow; Wed. from 7 to 9 commencing Sept. 25th.

The first semester was given in the spring of 1939-40. The course continues with the second half of R. A. Fisher's book of the same title. Supplementary material will be introduced for comparison with other methods; also for dealing with time series, and the representative method in sampling. The treatment will be non-mathematical.

Prerequisites: Correlation, an introductory course in statistics, and familiarity with the first half of the text.

29, 30. MULTIVARIATE ANALYSIS (V)—Mr. M. A. Girshick; offered every three years. Due in 1941-42. This course follows the one in linear algebra (Math. 17, 18).

31. ANALYSIS OF VARIANCE (V)—Mr. M. A. Girshick; offered every three years. Due again in 1942-43. This, along with the courses in Linear Algebra (Math. 17, 18) and Multivariate Analysis (Stat. 29, 30) form a three year cycle.

33, 34. THEORY AND APPLICATION OF THE CHARACTERISTIC FUNCTION (V)—Dr. Solomon Kullback. To be offered next year and every three years.

EDITING

Graduate and Advanced Undergraduate

EDITING MANUSCRIPTS ON AGRICULTURE, HOME MAKING, AND RELATED SUBJECTS (IV, 3 cr.)—Dr. M. C. Merrill, and the editorial, printing, and indexing staffs in the Division of Publications, Office of Information; Mon. and Wed. from 5 to 6:30 commencing Sept. 30th. Registration is limited to 40 students. Offered every year in the fall semester only.

This course is intended primarily for those seeking information on the editorial technique involved in handling manuscripts after they leave the author's hands and until they are issued in printed form. Discussion of the fundamental principles of editing, including the organization or rearrangement of material for effective presentation; rhetorical style in relation to subject matter; sentence structure and effective use of English; paragraphing and leads; consideration governing titles, tables of contents, headings, footnotes, illustrations, literature citations and bibliographies, and statistical checking; the principles of table formation and arrangement; typography and the relation of type to subject matter; and the fundamentals of indexing and proofreading. Practical examples of editorial work will be discussed in class. Opportunity for some familiarity with the style manual of the Government Printing Office will be provided. Collateral reading will be indicated. Those desiring credit for the course will be required to pass a written examination at the end of the semester.

G. P. O. STYLE MANUAL

Undergraduate

DRILL IN STYLE MANUAL—Miss Esther Celandier; Wed. from 5 to 7 commencing Oct. 2d. This is a one semester course and will be repeated in the spring semester; Wed. from 5 to 7 commencing Feb. 5th.

Drill course in the list of approved usages as embodied in the Government Printing Office Style Manual. Particular attention will be given to capitalization, spelling, compound words, abbreviations, numerals, symbols, punctuation, and to the setting up of tabular matter. This course will be conducted in collaboration with the Division of Publications, Office of Information; and lectures will be given by several members of the staff.

ENGLISH

Undergraduate

COMPOSITION AND RHETORIC (I, 2 cr.)—Dr. Susan E. Harman; Thurs. from 5 to 7 commencing Oct. 3d. This is a one semester course and will be repeated in the spring semester; Thurs. from 5 to 7 commencing Feb. 6th.

First quarter freshman English. An introductory course in writing and English usage, designed especially for those who need a course preparatory to the more advanced English courses. Special attention will be given to the fundamental principles and mechanics of good writing—grammar, punctuation, spelling, etc.

DESCRIPTIVE ENGLISH GRAMMAR (III, 2 cr.)—Dr. Susan E. Harman; Mon. from 5 to 7 commencing Oct. 7th. This is a one semester course and will be repeated in the spring semester; Mon. from 5 to 7 commencing Feb. 3d.

A course in grammatical principles, stressing sentence structure and correct English form. Students are required to analyze sentences by diagram and to correct examples of bad English.

VOCABULARY BUILDING AND DICTIONARY STUDY (II, 2 cr.) Mrs. Sallie M. Pease; Thurs. from 5 to 7 commencing Oct. 3d. This is a one semester course and will be repeated in the spring semester; Thurs. from 5 to 7 commencing Feb. 6th.

A course designed to help writers and speakers to express their ideas clearly and attractively.

ELEMENTS OF LITERATURE (I, II, 2 cr.)—Dr. Susan E. Harman; Wed. from 5 to 7 commencing Oct. 2d.

An introductory course in the study and appreciation of English literature. An examination and analysis of the major types of prose and verse. (Third quarter of Freshman English.)

HISTORY OF ENGLISH LITERATURE (II, III, 2 cr.)—Dr. Susan E. Harman; Wed. from 5 to 7 commencing Feb. 5th.

A historical study of English literature from Beowulf to Dryden. Open to students who have had composition and rhetoric.

LITERATURE AND DRAMA

Undergraduate

ELEMENTS OF LITERATURE (I, II)—Dr. Susan E. Harman—(See ENGLISH.)

HISTORY OF ENGLISH LITERATURE (II, III)—Dr. Susan E. Harman—(See ENGLISH.)

DEVELOPMENT OF WORLD DRAMA (III, 2 cr.)—Dr. C. H. McReynolds; Tues. from 5 to 7 commencing Oct. 1st. This is a one semester course and will be repeated in the spring semester; Tues. from 5 to 7 commencing Feb. 4th.

Beginning with Greece, the course treats the development of drama as revealed in plays of the various countries—Italy, Spain, France, Germany, Russia, Holland, and America (England not included). The course will be conducted in lectures and discussions, with the reading of a number of plays.

MUSIC AND LITERATURE APPRECIATION (III, IV)—Miss Cecile Willink. Available in 1941-42.

Graduate and Advanced Undergraduate

SELECTIONS FROM WORLD LITERATURE (III, IV, 2 cr.)—Dr. C. H. McReynolds; Fri. from 5 to 7 commencing Oct. 4th. This is a one semester course and will be repeated in the spring semester; Fri. from 5 to 7 commencing Feb. 7th.

Selections from the best literature of various ages and countries are read and discussed. The course consists of study, analysis, and appreciation of ideas and artistic conceptions as set forth by the greatest geniuses of all time

—their philosophy of life and its significance to life today. Among the writers included are Tolstoy, Boccaccio, Dante, Voltaire, Socrates, Plato, Mohammed, Aristotle, Machiavelli, Cervantes, Hugo, Homer, Ovid, Nietzsche, Buddha, Rousseau, Goethe, Ibsen, Vergil, Chekhov, Moliere, Horace, Petrarch, and others. (English and American literature not included.)

DRAMATIC SPEECH (IV, 2 cr.)—Dr. C. H. McReynolds; Wed. from 5 to 7 commencing Oct. 2d. This is a one semester course and will be repeated in the spring semester; Wed. from 5 to 7 commencing Feb. 5th.

A laboratory course, dealing with the dramatic elements in speech. It gives training through work on sketches, monologs, scenes, and speeches. Such elements as pause, action, improvisation, pantomime, ensemble, contrast, contact, and voice are emphasized. Each member of the class takes an active part at every session.

PLAY WRITING (IV, V, 2 cr.)—Miss Rebecca Dial; Tues. and Fri. at 5 commencing Oct. 1st. This is a one semester course and will be repeated in the spring semester; Tues. and Fri. at 5 commencing Feb. 4th.

Analysis of the one-act play; technique and practice in creative writing; selecting the plot germ; arrangement of the setting, development of plot, characterization, and dialogue. Individual criticism of scripts and preparation of the manuscript for the producer. Opportunity afforded for production of the most suitable scripts in cooperation with the Department "Players."

PLAY PRODUCTION (IV, V, 1 cr.)—Miss Rebecca Dial; Tues. from 6 to 7 commencing Oct. 1st. This is a one semester course and will be repeated in the spring semester; Tues. from 6 to 7 commencing Feb. 4th.

Selecting a play for production, casting, and technique of producing. This course is designed especially to help extension workers who desire to use this type of educational procedure.

WRITING

Undergraduate

SEMINAR IN CREATIVE WRITING (III, 2 cr.)—Mr. Edward M. Barron; Thurs. from 5 to 7 commencing Oct. 3d. This is a one semester course and will be repeated in the spring semester; Thurs. from 5 to 7 commencing Feb. 6th.

The work in the seminar is devoted to journalistic and creative writing. Detailed analyses are made of trends and current forms of the trade and the feature article, the familiar essay, the short story, the novelette, and the novel as developed in modern publications. The primary concern is with the artistry of words, facility of expression, and the mechanics of the various forms. The student's inclinations in literary work are studied and he is encouraged to develop along the paths where his natural talents lie. The course presupposes a fundamental knowledge of composition and rhetoric.

Graduate and Advanced Undergraduate

MAGAZINE AND FEATURE WRITING (IV, 3 cr.)—Mr. Edwin W. Hullinger; Tues. from 5 to 7, Thurs. from 7 to 8 commencing Oct. 1st.

A laboratory course in the writing of feature articles, designed to help the student gather material, find in it an appeal that will interest the general reader, and organize his information and opinion in a vivid style. There will be lectures on the mechanics of preparing manuscripts and the various types of articles, including the interview. Students will have an opportunity to discuss their writing problems with the instructor, both individually and in groups.

MAGAZINE AND FEATURE WRITING (ADVANCED) (IV, V, 3 cr.)—Mr. Edwin W. Hullinger; Tues. from 5 to 7, Thurs. from 7 to 8 commencing Feb. 4th.

A continuation of the preceding course with more specialized attention to writing technique, market problems, etc.

Prerequisite: Magazine and feature writing or equivalent in professional experience.

WORLD NEWS AND ITS INTERPRETATION (IV, 2 cr.)—Mr. Edwin W. Hullinger; Thurs. from 5 to 7 commencing Oct. 3d. This is a one semester course and will be repeated in the spring semester; Thurs. from 5 to 7 commencing Feb. 6th.

A study of world news and its background, with reference to its treatment in editorials and feature articles. News gathering machinery will be examined and "big stories" traced to their origins as they appear on front pages. There will be round-table discussions of what lies behind present relations between world powers. Students will be given practice in writing interpretive articles and editorials on current situations as they develop.

WRITING ADMINISTRATIVE REPORTS, MEMORANDUMS, AND MANUALS (IV)—Mrs. Florence P. Marks. Available in 1941-42.

EXTENSION EDUCATION

Graduate and Advanced Undergraduate

Open to those with extension teaching experience, or with background of educational training satisfactory to instructor.

EXTENSION ORGANIZATION AND PROGRAM DETERMINATION (IV, V, 2 cr.)—Messrs. M. C. Wilson and Barnard Joy; hours to be arranged. Commences Oct. 1st. Room 5534 South Bldg.

An analytical review of the best procedures to be followed in developing State, county, and community programs of work, and outlining of plans of work looking to the orderly development of specific projects, including a discussion of the place of local leaders in extension teaching. The representative organizations of rural people are studied for the purpose of discovering points of contact and interest for cooperation in the conduct of extension work.

EXTENSION METHODS (IV, V, 2 cr.)—Messrs. M. C. Wilson and Barnard Joy; hours to be arranged. Commences Feb. 3d. Room 5534 South Bldg.

Aims and objectives of extension teaching and possible ways of measuring accomplishments in this field are reviewed and critically analyzed. Various means and agencies employed in extension teaching are considered, such as result demonstrations, method demonstrations, meetings, news articles, personal service, bulletins, exhibits, and circular letters. They are evaluated from the standpoint of their teaching functions, adaptability, relative influence, cost, inter-relationship, and general effectiveness.

ORGANIZATION AND CONDUCT OF 4-H CLUB WORK (IV, V, 2 cr.)—Messrs. M. C. Wilson and Barnard Joy; hours to be arranged. Commences Oct. 1st. Room 5534 South Bldg.

The course includes the development of 4-H Club programs and organization considering. Objectives, psychological groupings, community integration, program content, community, county, State, and Federal organization, selection and use of local leaders, annual plans of work, the evaluation. It takes into consideration the methods employed in 4-H work including projects, club meetings, demonstrations, judging work, exhibits, achievement days, camps, short courses, and leader training.

SPEECH

Undergraduate

FUNDAMENTALS OF SPEECH (I, 2 cr.)—Mrs. Hester Beall Provensen; Tues. from 5 to 7 commencing Oct. 1st. This is a one semester course and will be repeated in the spring semester; Tues. from 5 to 7 commencing Feb. 4th.

Elementary speech training, specific to individual needs, based upon diagnostic study of individual differences and abilities. Training embraces the development of distinct utterance, voice improvement and speech in every-day social and business relationships. Each student speaks at every class meeting receiving specific and constructive criticism. Stress is placed upon vocabulary building.

EFFECTIVE SPEAKING (II, 2 cr.)—Mrs. Hester Beall Provensen; Thurs. from 5 to 7 commencing Oct. 3d. This is a one semester course and will be repeated in the spring semester; Thurs. from 5 to 7 commencing Feb. 6th.

The preparation and delivery of original speeches, speeches for special occasions, and the intelligent reading of script for radio presentation. Practice and criticism of extempore and impromptu speeches. Techniques for projection, modulation, and clarity of voice as speech situations require.

ORAL READING (II, 2 cr.)—Mrs. Sallie M. Pease; Tues from 5 to 7 commencing Oct. 1st. This is a one semester course and will be repeated in the spring semester; Tues. from 5 to 7 commencing Feb. 4th.

Much of the material that is presented to committees and other audiences involves more or less oral reading. Unless this is done in a clear, forceful manner, the effect is not what is desired. The best colleges and universities are now offering courses in oral reading to supplement courses in speech.

(See also LITERATURE AND DRAMA.)

PERSUASIVE AND ARGUMENTATIVE SPEAKING (II, 2 cr.)—Dr. C. H. McReynolds; Mon. from 5 to 7 commencing Feb. 3d.

A course in speech, featuring psychology of the audience—kinds of audiences, fundamental interests, psychological mechanics, suggestion. Speech construction—the brief, the outline, evidence, authority, subjective vs. objective speeches, variety, humor. Speech delivery—personality, action, gesture, pause, kinds of emphasis, and contact with the audience. There are speeches, round table discussions, open forums, and debates. Every student speaks at every session.

PERSONAL DEVELOPMENT—Mrs. Hester Beall Provensen; Wed. from 5 to 7 commencing Oct. 2d. This is a one semester course and will be repeated in the spring semester; Wed. from 5 to 7 commencing Feb. 5th. (Non-credit course.) Fee \$12.

Discovery and development of the potentialities of each student. Poise, confidence, appearance, make-up, dress and color sense, art of conversation, cultivation of wider range of interest, of curiosity. Actual social situations created and discussed. Conferences, guest speakers.

CHORAL SPEAKING (II, 2 cr.)—Mrs. Hester Beall Provensen; Mon. from 5 to 7 commencing Sept. 30th. This is a one semester course and will be repeated in the spring semester, Mon. from 5 to 7 commencing Feb. 3d.

A course teaching basic principles of voice production and speech by participation in group speaking. In speaking with others the timid acquire confidence and the assertive develop modulation and cooperation. Study of sounds of speech, training for careful articulation, audibility, volume, and sustained tone. Application of this training to speech, reading of verse and prose.

Graduate and Advanced Undergraduate

PREPARATION AND PRESENTATION OF PUBLIC ADDRESSES (IV, V, 2 cr.)—Dr. Knute E. Carlson; Fri. from 5 to 7 commencing Oct. 4th. This is a one semester course and will be repeated in the spring semester; Fri. from 5 to 7 commencing Feb. 7th.

This course will give special attention to collection, organization, and logical presentation of subject matter with various definite objectives in view.

Prerequisite: Basic public speaking or its equivalent.

DRAMATIC SPEECH (IV)—Dr. C. H. McReynolds—(See LITERATURE AND DRAMA.)

ENGINEERING

Graduate and Advanced Undergraduate

NAVAL ARCHITECTURE (IV, 2 cr. each sem.)—Mr. Charles L. Wright, Jr.; Tues. from 5 to 7 commencing Oct. 1st. Second semester, Feb. 4th. The first semester of this course will be repeated in the spring semester if a sufficient number of students register. Second semester hours—Mon. from 5 to 7 commencing Feb. 3d.

Determination of principle dimensions of a ship; development of ship lines; displacement and stability calculations; launching.

NAVAL ARCHITECTURE (IV, 2 cr.)—Mr. Charles L. Wright, Jr., Mon. from 5 to 7 commencing Sept. 30th.

The first semester was given in the spring of 1939-40. Trochoidal wave theory and rolling; speed and power of ships; steering.

SHIP CONSTRUCTION (IV, 2 cr. each sem.)—Mr. Charles L. Wright, Jr.; Thurs. from 5 to 7 commencing Oct. 3d. Second semester, Feb. 6th. The first semester of this course will be repeated in the spring semester if a sufficient number of students register, Wed. from 5 to 7 commencing Feb. 5th.

Mold-loft procedure; work of the steel mill; the building ways; weight estimate and strength calculations; riveting; welding; design of structural parts.

SHIP CONSTRUCTION (IV, 2 cr.)—Mr. Charles L. Wright, Jr.; Wed. from 5 to 7 commencing Oct. 2d.

The first semester was given in the spring of 1939-40. Design of deck fittings; arrangement plans; ventilation; wiring; piping; construction of deck houses; masts and rigging.

RADIO ENGINEERING (V)—Dr. L. P. Wheeler. Offered in alternate years; due again in 1941-42.

GLASS BLOWING

GLASS BLOWING (2 cr. each sem.) (A laboratory course for technicians)—Dr. Leland B. Clark; Mon. and Wed. at 4:50 commencing Sept. 30th; second semester, Jan. 27th, in the basement of the Smithsonian Institution. Fee \$18 per semester, including materials. Registration limited to ten students.

Simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the soft glasses will be utilized for practice; during the second semester the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

HISTORY

Undergraduate

HISTORY OF THE UNITED STATES (I, II, 2 cr. each sem.)—Dr. W. M. Gewehr; Thurs. from 5 to 7 commencing Oct. 3d. Second semester, Feb. 6th.

This is intended to offer a survey of American history from the time of the Revolution to the present. The period through the Civil War will be studied the first semester followed by a survey of American history since 1865 the second semester. The second semester's work may be taken as a unit by students who enter the course at that time but it is advisable to treat the year's work as a unit.

LATIN AMERICAN HISTORY (IV, V, 2 cr. each sem.)—Dr. Ernesto Galarza; Fri. from 5 to 7 commencing Oct. 4th. Second semester, Feb. 7th.

The lectures and discussions will deal with the main periods of the evolution of Latin America, stressing the social and economic aspects of change. The aim of the course will be to give a broad background which will enable the student to better and more clearly interpret the role of the twenty American republics in contemporary world affairs.

(Dr. Galarza, Chief of the Division of Labor and Social Information of the Pan-American Union, has spent many years in South America and is well qualified to give accurate first-hand information.)

FAMOUS WOMEN OF HISTORY—Miss Mary Sabarth—(See GENERAL LECTURES.)

RECENT HISTORY OF THE UNITED STATES—Dr. W. M. Gewehr. Available in 1941-42.

WORLD POLITICS—Dr. W. M. Gewehr. Available in 1941-42.

LANGUAGES

The standard university language course is three semester hours, each class of fifty minutes. The courses now given for two semester credits meet twice weekly for sixty minute periods. The standard requirements (3 cr.) may therefore be met by an additional thirty minutes a week. Those desiring the three semester credits in courses marked "2-3 cr." must so register in advance, paying \$18 per semester instead of \$12.

Courses marked I, II, are undergraduate, those marked III, IV, are advanced undergraduate or graduate.

ELEMENTARY FRENCH (I, II, 2-3 cr. each sem.)—Dr. Harry B. Humphrey; Mon. and Wed. at 5 commencing Sept. 30th. Second semester, Feb. 3d.

Instruction in elements of French grammar. Reading and translation of elementary articles from selected texts. This course is designed to prepare beginners for the advanced course in French.

ADVANCED FRENCH (III, IV, 2-3 cr. each sem.)—Dr. Harry B. Humphrey; Tues. and Thurs. at 5 commencing Oct. 1st. Second semester, Feb. 4th.

CONVERSATIONAL FRENCH—Miss Mary Sabarth; Wed. at 5 commencing Oct. 2d. Groups limited to 15. Fee for each class \$12. These are one semester courses and will be repeated in the spring semester; Wed. at 5 commencing Feb. 5th.

These classes are designed to give facility in conversation, use of idiom and correct pronunciation, development of vocabulary in social and business dealings.

CLASS 1. Prerequisite: One year of French grammar.

CLASS 2. Prerequisite: Two years of French grammar.

CLASS 3. Prerequisite: Three years of French grammar.

CLASS 4. Prerequisite: Four years of French grammar.

ELEMENTARY GERMAN (I, II, 2-3 cr. each sem.)—Dr. C. H. Leineweber; Mon. from 5 to 8 commencing Sept. 30th. Second semester, Feb. 3d.

Instruction in elements of German grammar. Reading and translation of elementary articles from selected texts. This course is designed to prepare beginners for the advanced course in German.

ADVANCED AND TECHNICAL GERMAN (III, IV, 2-3 cr. each sem.)—Dr. C. H. Leineweber; Fri. from 5 to 8 commencing Oct. 4th. Second semester, Jan. 31st.

GERMAN TRANSLATION (III, IV, 1½ cr. each sem.)—Mr. Ira T. Braunstein; Wed. from 5 to 6:30 commencing Oct. 2d. Second semester, Feb. 5th. Fee \$9.

Prerequisites: German grammar and reading knowledge of German.

CONVERSATIONAL GERMAN—Miss Mary Sabarth; Tues. at 5 commencing Oct. 1st. Groups limited to 15. Fee for each class \$12. These are one semester courses and will be repeated in the spring semester, Tues. at 5 commencing Feb. 4th.

These classes are designed to give facility in conversation, use of idiom and correct pronunciation, development of vocabulary in social and business dealings.

CLASS 1. Prerequisite: One year of German grammar.

CLASS 2. Prerequisite: Two years of German grammar.

CLASS 3. Prerequisite: Three years of German grammar.

CLASS 4. Prerequisite: Four years of German grammar.

ELEMENTARY ITALIAN (I, II, 2-3 cr. each sem.)—Dr. Nicholas G. Barbella; Tues. from 5 to 8 commencing Oct. 1st. Second semester, Feb. 4th.

The fundamentals of the language, with practice in conversation. Texts: Joseph L. Russo, *Elementary Italian Grammar*; Marro, *Contemporary Italian Short Stories*.

ELEMENTARY RUSSIAN (I, II, 2-3 cr. each sem.)—Dr. C. H. Leineweber; Wed. from 5 to 8 commencing Oct. 2d. Second semester, Feb. 5th.

ELEMENTARY SPANISH (I, II, 2-3 cr.)—Miss Ruberta M. Olds;
Mon. from 5 to 7:30 commencing Sept. 30th.

The aim of this course is to secure accuracy and facility in the use of the language by means of drill in pronunciation, grammar, conversation, and reading.

INTERMEDIATE SPANISH (I, II, 2-3 cr.)—Miss Ruberta M. Olds;
Mon. from 5 to 8 commencing Feb. 3d.

A continuation of the Elementary Spanish.

Prerequisite: Elementary Spanish or its equivalent.

SPANISH CONVERSATION AND COMPOSITION (II, III, 2-3 cr. each sem.)—Miss Ruberta M. Olds; Wed. from 5 to 8 commencing Oct. 2d. Second semester, Feb. 5th.

An advanced course designed to develop ability to understand and to converse in idiomatic Spanish, to translate articles in newspapers and magazines, to compose and translate ordinary business and social letters, and to read for enjoyment.

Prerequisite: Intermediate Spanish or its equivalent.

MANAGEMENT

Undergraduate

PRINCIPLES OF ADMINISTRATIVE MANAGEMENT (I, II, 2 cr.)
—Dr. Eldon L. Johnson; Mon. and Wed. at 5 commencing Sept. 30th.

This course is designed to introduce the student to the elements of organization and personnel and fiscal management. Attention will be devoted to the evolution of administrative organization; organizational types; staff, line, and auxiliary agencies and functions; problems and types of coordination and controls of administration; the broadest aspects of personnel selection, classification, training, movement, and relations; brief attention to budgeting and fiscal control; the relation of layman, expert, and administrator. The object of the course is to lay a broad foundation for more intensive courses in management.

PROBLEMS IN ADMINISTRATIVE MANAGEMENT (III, IV, 2 cr.)—Dr. Eldon L. Johnson; Mon. from 5 to 7 commencing Feb. 3d.

Course will deal largely with the application of principles to specific problems in one of the following fields, to be selected later: (1) Organization and management (2) personnel administration (3) financial administration. Specialists will be brought in for lectures and round-table discussions.

SUPERVISORY TRAINING (IV, V, 2 cr.)—Mr. Henry H. Farquhar and specialists; Fri. from 5 to 7 commencing Feb. 14th.

This course covers the importance, the principles, and the practices of sound supervision. Emphasis is placed upon the various ways in which supervisory relationships (or the structure of organization) may be arranged, with the consequent ease or difficulty of establishing clear lines of authority and of fixing individual accountability; the tangible and the intangible factors in leadership and morale building; supervisory control thru operating budgets and executive reports; guidance, training, and the handling of typical personnel problems including that of getting personnel "grievances" and constructive suggestions before the proper higher officials; planning work and dividing it up into specific jobs; making efficiency ratings and other measurements of employees and their work; and similar every-day aspects of the supervisor's duties. The course is conducted largely thru "round table" discussions; for this purpose each student is expected to turn in several of his own personal supervisory problems which, after reworking and disguising, are distributed for solution or comment by students with summary and conclusion by the instructor.

Where registration justifies the class will be divided into two groups (at least for some of the sessions): (a) Those with little supervisory experience, and (b) those with advanced experience.

PRINCIPLES OF EMPLOYEE TRAINING (IV, V, 2 cr.)—Mr. Presley W. Melton; Mon. from 7:30 to 9:30 commencing Sept. 30th.

A series of fifteen seminar discussion meetings. Subjects to be discussed will include objectives of employee training; laws and regulations affecting employee training; organization of staff training offices; qualifications of training officers; enlisting executive support for training programs; conference procedure; breaking in new employees; understudy and intern procedure; apprentice training; correspondence training; use of visual aids; relations with educational institutions.

PROBLEMS IN ADMINISTRATION AND SUPERVISION (IV, V, 2 cr.)—Mr. Presley W. Melton; Mon. from 5 to 7 commencing Sept. 30th.

A series of fifteen seminar discussion meetings. Subjects to be discussed will include improving organization; planning budgets; selecting competent employees; breaking in new employees; promoting and terminating employees; building morale; cooperating with division chiefs; holding staff meetings; training supervisors; maintaining relations with civic and trade associations; writing for press and radio; using visual aids in public speaking.

The course will be open to persons with several years experience in administrative or supervisory work in government, commercial, or industrial agencies.

MANAGEMENT OF GOVERNMENT CORPORATIONS (IV, V, 2 cr.)—Dr. Richard A. Kahn; Mon. from 5 to 7 commencing Oct. 7th.

Study of the management of government corporations as administrators of parts of the national economic life. Their history, causes of modern developments, and international characteristics will be considered. The Federal corporations, their activities, structure, management, control, and interrelations will be analyzed.

METEOROLOGY

Graduate and Advanced Undergraduate

An educational program more complete than in previous years is planned by the Weather Bureau beginning with the fall semester of 1940.

Prof. C. G. Rossby, who until coming to the Weather Bureau as Assistant Chief in Charge of Research, was in charge of the Meteorological Division of the Massachusetts Institute of Technology, will conduct the educational program, which will include the following courses in the Graduate School:

FORECASTING ANALYSIS (IV, 2 cr.)—Mr. Benarthur C. Haynes; Tues. and Thurs. from 6:10 to 7:10 at the Weather Bureau, commencing Feb. 4th. Offered in the spring semester only.

Application of modern meteorological theories to forecasting. Displacements of fronts and pressure systems, frontogenesis and frontolysis, frontal and air mass weather, fog and stratus cloud forecasting, thunderstorm forecasting and special weather forecasts.

Prerequisites: Descriptive meteorology or an equivalent general course in meteorology; elementary knowledge of differential and integral calculus. The continuity of the course will follow the first semester of the descriptive meteorology course.

SYNOPTIC WEATHER MAP ANALYSIS (IV, V, 2 cr. each sem.)—Mr. Benarthur C. Haynes, assisted by specialists; meeting of the class by special arrangement with instructor, commencing Oct. 1st. Second semester, Feb. 3d.

A laboratory course open to not more than twelve students. The first semester covers practice in the analysis of synoptic charts of the surface and an introduction into upper-air analysis. The second semester will be a continuation of surface analysis with added emphasis on various upper-air charts and the application of modern forecasting methods.

CLIMATOLOGY (III, IV, 2 cr.)—Dr. C. Warren Thornthwaite; Tues. and Thurs. from 5:10 to 6 commencing Feb. 4th. Offered in the spring semester only.

Climatology, based on newer concepts of physical meteorology. Problems of agriculture, hydrology, soil conservation, land forms, and human settlement in its relation to climatic or meteorologic conditions will be discussed.

DESCRIPTIVE METEOROLOGY (III, IV, 2 cr.)—Mr. Benarthur C. Haynes, assisted by specialists; Tues. and Thurs. from 5:10 to 6 at the Weather Bureau, commencing Oct. 1st. Offered in the fall semester only.

One semester devoted to a general treatment of atmospheric processes with special emphasis on methods of air mass analysis and their application to synoptic charts of the surface and upper-air and to forecasting. The course is intended to be of an introductory nature, but those without some familiarity with meteorology will be at a disadvantage.

DYNAMIC METEOROLOGY (IV, V, 3 cr. each sem.)—Dr. C. G. Rossby, assisted by specialists; Mon., Wed., and Fri. from 5 to 6 at the Weather Bureau, commencing Sept. 30th. Second semester, Feb. 3d.

A thorough survey of the field including thermodynamics of the atmosphere, equation of motion of atmospheric flow, energy transformations, lateral and vertical turbulence, and special problems of the general circulation.

Prerequisites: Mathematics through ordinary differential equations; two years of college physics; general knowledge of meteorology.

ASTRONOMY

Advanced Undergraduate

GENERAL ASTRONOMY (IV, 2 cr. each sem.)—Mr. A. Hughlett Mason; Tues. from 5 to 7 commencing Oct. 1st. Second semester, Feb. 4th.

The earth as an astronomical object, celestial coordinates, the sun as a star, determination of time, the moon, eclipses, the planets, comets and meteors, the stars, and methods of determining their distances. The galaxy, galactic and extra-galactic nebulae, cosmogony.

MINERALOGY

Graduate and Advanced Undergraduate

MINERALOGY: DESCRIPTIVE AND DETERMINATIVE (III, IV, 2-3 cr. each sem.)—Miss Jewell J. Glass; Tues. and Thurs. at 5 commencing Oct. 1st. Second semester, Feb. 4th. Registration limited to 12 students. Fee \$15 per semester. (Room N-1238 North Interior Building.)

Inspection of the common rock-forming minerals, in hand specimens, in crystal form, and in rock masses. Descriptive physical properties. External forms, structure, texture, hardness, specific gravity, cleavage, color, etc. A brief review of crystallography, and of the chemical characters of each species. Mode of occurrence and characteristic associations of each mineral. Uses and economic importance. Illustrated lectures and laboratory demon-

stration of the study of the internal crystalline structure (atomic structure) of minerals by the X-ray and electron diffraction methods, given by eminent workers in that field.

Laboratory: Identification of mineral specimens (100 unknowns); (a) by blowpipe analysis; (b) by qualitative chemical tests. Series of 6 Saturday afternoon field excursions, to be counted as laboratory work.

Prerequisites: One year freshman chemistry. Physics desirable, but not required.

USE OF THE POLARIZING (PETROGRAPHIC) MICROSCOPE (V, 2 cr.)—Dr. Earl Ingerson (Geophysical Laboratory); Fri. at 5 commencing Sept. 27th. One lecture and three laboratory hours per week; laboratory hours to be arranged. Fee \$15 per semester.

The behavior of light in crystals and crystalline aggregates. Determination of optical constants of crystals and determination of unknown crystals from their optical properties. Mineral crystals will be used as unknowns, because complete tables are available for their identification, but inorganic reagents and organic compounds will also be studied with special reference to techniques required in their identification. Fibers, starch granules, and other complex organic materials will be considered.

Prerequisites: Physics and mineralogy.

PHILOSOPHY

Graduate and Advanced Undergraduate

HISTORY OF PHILOSOPHY (IV, V, 3 cr. each sem.)—Dr. George S. Painter; Fri. from 5 to 8 commencing Oct. 4th. Second semester, Jan. 31st.

First semester. Ancient Philosophy, from the beginning of philosophy to the Modern Period.

Second semester. Modern Philosophy from the Renaissance to the present time.

SCIENCE AND EVOLUTIONARY THEORY (IV, V, 2 cr.)—Dr. George S. Painter; Mon. from 5 to 7 commencing Sept. 30th.

A study of the data of both cosmological and biological aspects of the most comprehensive scientific theory, with the aim of understanding its conformity with the requirements of positive science and an evaluation of the theories in their several aspects in behalf of true scientific achievement.

PHILOSOPHY AND THE WORLD CRISIS (IV, V, 2 cr.)—Dr. Fritz Marti; Wed. from 5 to 7 commencing Oct. 2d.

A consideration of some of the philosophical backgrounds of contemporary history, presented as an adult introduction to philosophy. The lectures will follow a syllabus, but they will also dwell upon the problems implied in the weekly batch of student questions. Discussion is to give some training in philosophical method. The main results of occidental philosophy will be brought within the students' reach.

AMERICAN PHILOSOPHY (IV, V, 2 cr.)—Dr. Fritz Marti; Wed. from 5 to 7 commencing Feb. 5th.

A survey of American thought from Colonial times to the present. Informal lectures will introduce the student to the ideas which helped to form the American mind. Students working for credit are required to read short selections from the writings of the main thinkers. Students who desire to read deeper into some specific author are welcome to report on their findings in class; this would help the discussions without turning the course into a display of technicalities.

PSYCHOLOGY AND SOCIOLOGY

Graduate and Advanced Undergraduate

THE PROBLEMS OF PERSONAL ADJUSTMENT (IV, V, 2 cr.)—Dr. Paul Kaufman; Tues. from 5 to 7 commencing Sept. 24th.

Analysis of the common personality problems of normal people, and survey of techniques of self-analysis and methods of solving personal difficulties. Emphasis is given to the origins of conflicts in the unconscious. Several of the current standard personality tests are provided for each student. The program is designed not only for those interested in such a survey of the personal adjustment field, but also for those seeking guidance in the creative development of their capacities.

This course is a logical preliminary to the Seminar in Personnel Counseling offered in the spring semester.

SEMINAR IN PERSONNEL COUNSELING (IV, V, 2 cr.)—Dr. Paul Kaufman; Tues. from 5 to 7 commencing Feb. 4th.

SOCIAL PSYCHOLOGY (IV, V)—Dr. Paul Kaufman. Available in 1941-42.

PSYCHOLOGY OF HUMAN MOTIVATION (IV, V, 3 cr. each sem.)—Dr. Rensis Likert; Wed. from 5 to 8 commencing Oct. 2d. Second semester, Feb. 5th.

An analysis of the major motivational forces influencing human behavior in everyday life, and an examination of available techniques for determining and measuring these attitudes and motives. Evidence and data from scientific studies in the fields of industry and government will be used extensively.

***THE EVOLUTION OF AMERICAN RURAL LIFE** (IV, V, 3 cr.) (fall sem.)—Drs. Carl C. Taylor, John Provinse, and Paul Johnstone; Mon. and Wed. from 5 to 6:30 commencing Sept. 23d.

This course will trace the evolution of rural society in the United States from the standpoint of the characteristics, ideologies, attitudes, and opinions

of the peoples who founded its rural society, formed its settlement patterns, and gave it its unique culture in the different regions and subregions of the country. It will take into consideration the contributions to our rural culture of type of farming, nationality and ethnic groups, social and psychological characteristics of the people, and all social and cultural factors which help to describe rural America.

THE CULTURAL REGIONS OF THE UNITED STATES (IV, V, 3 cr.) (spring semester)—Drs. Carl C. Taylor, John Provinse, and Paul Johnstone; Mon. and Wed. from 5 to 6:30 commencing Feb. 3d.

This course will continue the study of the cultural regions of the United States for which the groundwork was laid in the fall semester in broad outline, and will study in detail the characteristics of the various regions and subregions and their inter-relationships, including settlement patterns, social organizations and institutions, prevailing ideologies, modes and folkways, and dominant attitudes and opinions of the people who live in the rural areas of these cultural regions.

***SEMINAR IN POPULATION PROBLEMS (IV, V, 3 cr. each sem.)**
—Dr. Conrad Taeuber; Fri. from 5 to 8 commencing Oct. 4th.
Second semester, Feb. 7th.

The major shifts of population within the United States, rural to urban and urban to rural. The Western movement shifts in population from South to North. Concentration of population within a few areas. The relation of population movements to economic resources and conditions.

AGRICULTURAL LABOR PROBLEMS IN THE UNITED STATES (IV, V, 3 cr.) (fall sem.)—Dr. Wm. T. Ham; Mon. and Wed. from 5 to 6:30 commencing Oct. 1st.

This course deals with varying relationships of labor, both farm family and hired, in different type-of-farming areas, on farm enterprises of varying size, and at different times in the history of American agriculture. Factors affecting the supply of farm labor and the demand for it are analyzed, with especial attention to seasonal and migratory workers, also current tendencies affecting the position of farm laborers with reference to the "agricultural ladder." Methods of improving the status of agricultural laborers are considered.

***RURAL COMMUNITY ORGANIZATION (IV, V, 2 cr.)** (spring sem.)—Drs. C. P. Loomis and D. Ensminger; Mon. from 7:30 to 9:30 commencing Feb. 3d.

The role of the community in action and planning programs; the historical background of communities in the various regions of the United States and in other countries; community organization; leadership and means of developing it.

THE SOCIAL ASPECTS OF FARM TENANCY (IV, V, 3 cr.) (spring sem.)—Dr. E. J. Holcomb; Fri. from 5 to 8 commencing Jan. 31st. (Course description available after Dec. 15.)

***RURAL SOCIAL PSYCHOLOGY (V, 2-3 cr.)**—Dr. Carl C. Taylor; Thurs. from 5 to 7 commencing Jan. 30th.

This course deals with the psychology and social psychology of rural groups—communities, institutions, farmers' organizations, and rural classes; with the customs, traditions, and folkways of rural peoples; and with the interactions between rural and urban cultures. It gives special consideration to what may be called the folklore of rural society, and the influence of farm practices and relative isolation on the attitudes, opinions, and philosophies of farm people. Specific topics such as suggestion, imitation, public opinion, farmer pressure groups, and farmers' movements will be discussed.

Prerequisites: Either one course in social psychology, or one course in sociology and one course in psychology.

CONTEMPORARY SOCIAL THEORY (IV, V, 3 cr.) (spring sem.)
—Dr. Chas. P. Loomis; Tues. from 5 to 8 commencing Feb. 4th.
(Course description available after Dec. 15.)

THE HISTORY OF SOCIAL THEORY (IV, V, 3 cr.)—Dr. Chas. P. Loomis. Available in the fall sem. of 1941-42.

THE RURAL COMMUNITY (IV, V, 2 cr.)—Drs. C. P. Loomis and D. Ensminger. Available in the fall sem. of 1941-42.

SOCIAL AND LEGAL

Graduate and Advanced Undergraduate

***ORGANIZED LABOR AND THE LAW**—(See ECONOMICS.)

***THE INDIVIDUAL WORKER AND THE LAW**—(See ECONOMICS.)

***BUSINESS LAW (IV, V, 3 cr. each sem.)**—Mr. Walter H. Young; Tues. from 5 to 8 commencing Oct. 1st; 2d semester, Feb. 4th.
Fee \$22.50.

PATENT LAW AND PROCEDURE (IV, V, 2 cr.)—Mr. Paul D. Boone; Fri. from 5 to 7 commencing Oct. 4th.

Rules of practice in the U. S. Patent Office; preparation of applications; amendments; Patent Office action; Commissioner's decisions, such as taken up in Woolcott's manual; file histories of patents, etc.

CONGRESSIONAL PROCEDURE (IV, V, 3 cr.)—Dr. Floyd M. Riddick; Tues. from 5 to 8 commencing Oct. 1st.

This course includes a comprehensive study of parliamentary procedure and party organizations and manipulations as recognized and utilized in the House and Senate of the United States Congress. General principles of

parliamentary law as utilized by all deliberative bodies are reviewed. All possible courses a bill might take and all possible ways of disposing of a bill from time of introduction to passage or defeat are considered.

LEGISLATIVE METHODS (IV, V, 3 cr.)—Dr. Floyd M. Riddick; Tues. from 5 to 8 commencing Feb. 4th.

The legislative program of a normal session of Congress is used as a guide to study the annual problems confronting a session of the House and Senate. The major pieces of legislation before the current session of Congress as concerned with procedure to their enactment will be traced.

Prerequisite: Congressional procedure or its equivalent.

THE FUNDAMENTAL PRINCIPLES OF INTERNATIONAL LAW AND RELATIONS (IV, V, 2-3 cr. each sem.)—Dr. Montell Ogdon; Mon. from 5 to 8 commencing Sept. 30th.

First semester. Social and economic bases of international law; nature of the society of nations; analysis of the different types of international organizations, with special emphasis upon those affecting agriculture; diplomatic relations, including the qualifications and functions of diplomatic, consular and other agents abroad; organization and procedure of international conferences; commercial agreements, treaties and other international agreements.

Second semester. Causes and nature of international differences; measures short of war; nature and commencement of war; area and general effects of belligerent operations; special emphasis upon effects of war on agriculture, e. g., blockade, diversion of goods destined to belligerents, prizes, contraband, blacklists, navicerts, etc.; neutrality; non-belligerency; military occupation; termination of war; amicable modes of settlement of international differences; the prevention of war.

UNITY IN THE LABOR MOVEMENT—(See ECONOMICS.)

THE PROBLEM OF UNEMPLOYMENT—(See ECONOMICS.)

ACCOUNTING IN THE FIELD OF LEGAL PROBLEMS (V, 2 cr. each sem.)—Mr. Mark S. Massel; Tues. from 5 to 7 commencing Oct. 1st. Second semester, Feb. 4th.

This course is designed to present significant accounting concepts in the field of legal problems. It will include a general exposition of accounting methods in correlation with pertinent legislation, administrative rulings, and case material.

Purposive character of accounting: Balance sheets, assets, liabilities, capital. Income and profit and loss statements. Reserves and deferred assets. The various types of accounts will be analyzed as problems in accounting methods and in various legal fields, such as stockholders' suits, income bonds, patent suits, income taxes, property taxes, fraud, estates, public utility regulation, and reorganizations. Differences in the interpretation of accounts in the various legal fields will be stressed.

Prerequisite: Two years of law or permission of the instructor.

SOIL SCIENCE

Graduate and Advanced Undergraduate

SOILS: THEIR MORPHOLOGY, GENESIS, AND CLASSIFICATION (IV, V, 3 cr.)—Dr. Charles E. Kellogg; Tues. and Thurs. from 5 to 6:30 commencing Feb. 4th.

The nature of soils and the broad principles governing their behavior are first discussed, followed by consideration of soil morphology, formation, and classification. Particular attention is given to the characteristics of the great soil groups and their genesis in relationship to the physical and biological forces of the environment. The soil geography of the United States is dealt with broadly, but some examples from other parts of the world are used. Throughout the course, the relationships of soil characteristics to agricultural development, soil use and conservation, and patterns of human occupancy are emphasized.

Prerequisites: Freshman chemistry or its equivalent. Previous or collateral reading in plant physiology, geology, geography, and logic would be helpful, but not essential.

SOILS AND PLANNING—SEMINAR (V, 1 cr.)—Dr. Charles E. Kellogg; Fri. at 5 commencing Feb. 7th.

Seminar discussions dealing with the use of the data and technique of soil science in land classification and land-use planning. Present problems of coordination of soil data with those from other disciplines will be dealt with and illustrated with particular examples. Good preparation in soil science desirable.

SOIL CONSERVATION

Undergraduate

SOIL CONSERVATION (II, 2 cr.)—Dr. Jay A. Bonsteel; Mon., Wed., and Fri. at 5 commencing Oct. 7th and ending Dec. 20th.

A guidance course intended to give a broad, general view of the physical aspects of soil conservation problems and a basic outline of the extent and the causes of soil erosion and the methods employed for its prevention; a summary of the research, planning, operations, and progress of soil conservation in the main physical and agricultural regions of the United States.

GEOGRAPHY

Graduate and Advanced Undergraduate

***INTRODUCTION TO METHODS OF QUANTITATIVE GEOGRAPHY (IV, V, 2 cr. each sem.)**—Dr. John Kerr Rose; Tues. from 5 to 7 commencing Oct. 1st. Second semester, Feb. 4th. Several important sections of the field of geography will be surveyed, including population distribution, agricultural geography, land utilization, and climatology. The general approach will be that of the recognition and definition of problems that can be studied by quantitative technique; survey of quantitative contributions that have been made thereto. Specific application and utility of descriptive statistics, correlations, and sampling techniques. Areal indices and measures of association applied to data having spatial distribution. The statistical techniques used will be introduced and taught as needed. The second semester extends the work of the first semester into economic and industrial geography with special attention to location theory.

GRAPHIC PRESENTATION

Undergraduate

These subjects have a two-fold purpose: First, training in graphic expression; second, developing draftsmen as designers and supervisors in the architectural and mechanical fields.

Prerequisites: Fifteen standard high school units or equivalent.

FREEHAND DRAWING AND SKETCHING (III, IV, 2 cr.)—Miss Carrie C. Carte; Wed. and Fri. from 5 to 7 commencing Oct. 2d. Fee \$15. This is a one semester course and will be repeated in the spring semester; Wed. and Fri. commencing Feb. 5th.

A study of light and shadow, color and line. An intensive study of theory and harmony of color and composition from still life, and pictorial and outdoor sketching. The student may work with any medium such as pencil, colored pencil, charcoal, water colors, pastels, oils, etc. Each student will receive individual criticism. Open to both beginners and advanced students. Sketching only, two hours a week, on Fri. from 5 to 7; fee \$10. *Note:* No credit will be given to students working only on Fridays.

SHADES AND SHADOWS (III, IV, 2 cr.)—Miss Carrie C. Carte; Wed. and Fri. from 5 to 7 commencing Oct. 2d. Fee \$15. This is a one semester course and will be repeated in the spring semester; Wed. and Fri. commencing Feb. 5th.

An intensive study of the effect of the direction of light; problems in shades and shadows with relation to architectural forms and ornament. Each student will receive individual criticism. Open to both beginners and advanced students.

PERSPECTIVE DRAWING (III, IV, 2 cr.)—Miss Carrie C. Carte; Wed. and Fri. from 5 to 7 commencing Oct. 2d. Fee \$15. This is a one semester course and will be repeated in the spring semester; Wed. and Fri. commencing Feb. 5th.

Definitions and general theory of visual rays and study of perspective projection of an object on the picture plane. Problems representing upon a plane surface the appearance of objects as seen from some given point of view. Each student will receive individual criticism. Open to both beginners and advanced students.

INTERIOR DECORATION (I, 1 cr.)—Miss Harriet Garrels; Wed. from 5 to 6 commencing Oct. 2d. Fee \$6. This is a one semester course and will be repeated in the spring semester; Wed. from 5 to 6 commencing Feb. 5th.

How to create backgrounds of good taste and personality—art principles underlying interior decoration.

Discussion of principles of arrangement, color, selection, charm at least expense, the small house, domestic architecture, the apartment, rooms in detail, period styles such as early American, Modern, etc., furniture, rugs, antiques, flower arrangement, what to hang and how to hang it.

BIOLOGICAL ILLUSTRATION—Mr. William N. Dovener; registration should be completed by Oct. 15th. Days and hours to be arranged. Fee \$15.

Individual training for those who desire to specialize in this field.

ARCHITECTURAL DRAWING (II, III, 2 cr. each sem.)—Mr. G. L. Edick; Tues. and Thurs. from 7 to 9 commencing Oct. 1st. Second semester, Feb. 4th. New students will be admitted the second semester. Fee \$20 per semester.

Geometrical problems, orthographic projections, lettering, architectural symbols. Residence design, working drawings, details of construction, studies of modern methods of framing, and use of building materials.

MECHANICAL DRAWING (II, III, 2 cr. each sem.)—Mr. G. L. Edick; Tues. and Thurs. from 7 to 9 commencing Oct. 1st. Second semester, Feb. 4th. New students will be admitted the second semester. Fee \$20 per semester.

Geometrical problems, orthographic projections, intersections and developments, lettering, and study of material symbols. Studies in machine shop practice, assembly and detail drawings, scale detail drawings from measured sketches by the student.

VISUAL INFORMATION (III, IV, 2 cr.)—Mr. Paul Bissell; Fri. from 5 to 7 commencing Oct. 4th. This is a one semester course and will be repeated in the spring semester; Fri. from 5 to 7 commencing Feb. 7th. Fee \$12.

This course is designed to aid the information specialist in presenting his information to the public in the most forceful visual form consistent with the restrictions imposed by the practical necessities of the problem. It will include talks on proved methods used in determining the best mediums through which to reach the public with specified information. Instruction and criticism will be given on layout, lettering, posters, poster design, and commercial art illustration. A non-technical discussion of the various processes of reproduction and printing will be included. The advantages and limitations of the methods will be studied as well as the variance in costs. Methods of preparing "roughs," or "dummies," so that, though lacking artistic ability himself, he may be able to express his ideas in such visual form as to assure a satisfactory finished product from the workman, artist, engraver, or printer.

GRAPHIC CORRELATION—(See STATISTICS.)

GRAPHIC METHODS APPLIED TO RESEARCH ANALYSIS—
(See STATISTICS.)

ART APPRECIATION

Undergraduate

PRINCIPLES OF ART APPRECIATION (III, 2 cr.)—Dr. Fritz Marti; Mon. from 5 to 7 commencing Sept. 30th.

[There is a pronounced interest in art, in this country, but many among the educated are at a loss as to the proper approach to art, and the best enjoyment of it.] This course will be conducted by lectures illustrated with slides, by class discussion of principles, and by occasional visits to museums. A reasonable amount of time will be given to the pedagogical application of the principles studied in this course.

PHOTOGRAPHY

Advanced Undergraduate

BASIC PHOTOGRAPHY (III, IV, 2 cr.)—Mr. Carl H. Hanson and other specialists; Mon. and Wed. at 5 commencing Feb. 3d.

There are no prerequisites. The course will be elementary and basic in character and will be designed to meet the needs of the amateur. Text: Air Corps Training Manual No. 2170-5, "Basic Photography," for sale by the Superintendent of Documents—price 65 cents.

Tentative outline of the course.

Elementary photographic optics, selection and use of photographic lenses, cameras and shutters, films and plates, the photography of colored objects, exposure, elementary photographic chemistry, preparing solutions, darkroom arrangement, conveniences and practices, developers and development, the technique of developing roll films, film packs and plates, the science of printing, the practice of printing, the camera in use, selection and arrangement of the subject, outdoor photography, enlarging papers, equipment and devices, how to make enlargements, finishing photographic prints, miniature camera photography, home portraiture, lighting and posing in portraiture, indoor photography, line work and copying, color photography, amateur motion picture cameras, equipment, and materials.

CLERICAL AND SECRETARIAL

Undergraduate

GOVERNMENT CORRESPONDENCE (II, 2 cr.)—Mrs. Florence P. Marks; Tues. from 5 to 7 commencing Oct. 1st. This is a one semester course and will be repeated in the spring semester; Tues. from 5 to 7 commencing Feb. 4th.

The writing of Government letters from the organization of subject matter to the language of the letter, paragraphing, construction of effective sentences, and correct usage. Vocabulary building. Methods for improving expression. Development and application of appraisal standards. Discussion of the problems involved in dictating and reviewing correspondence and supervising letter writers from the standpoint of the stenographer, dictator, reviewer, and supervisor.

AUDITING PROCEDURE (Government vouchers and related documents) (II, 2 cr. each sem.)—Mrs. Florence P. Marks; Wed. from 5 to 7 commencing Oct. 2d. Second semester, Feb. 5th.

First semester. General principles, purchase vouchers, transportation vouchers, claims and adjustments.

Second semester. Reimbursement, advertising, and adjustment vouchers; payrolls; collections.

MAIL AND FILES PRACTICES (II, 1½ cr.)—Messrs. John S. Lucas, Richard E. Kaufmann, William Muller, and James R. Roads; Tues. from 5 to 6:30 commencing Oct. 1st. Fee \$9 per semester.

Mail and files procedures. The course will embrace instruction in the following subjects: filing and records; mail handling; telegrams; messenger service. Procedure in records units, embracing subject filing, classification techniques, briefing and cross indexing, sorting and preparation of material, folder and guide arrangement, retirement of material to inactive status, searching, tickler systems, arrangement of offices, equipment and filing materials.

ADVANCED SECRETARIAL TRAINING—Mrs. Alice Coffman; Tues. from 5 to 7 commencing Feb. 4th.

Designed for those secretaries who would develop their duties, traits, and knowledges to qualify them for a higher degree of efficient service. The course will embrace instruction to assist the student in gaining a deeper insight into the principles of governmental secretarial work and their relation to office organization, help on problems of business etiquette and in meeting the demands of the vocation. Special stress will be laid upon the broader cultural aspects of the secretary's training, and upon the mastery of secretarial skills.

Prerequisites: Secretarial training (offered in the fall semester), or minimum CAF-4.

SECRETARIAL TRAINING—Mrs. Alice Coffman; Tues. from 5 to 7 commencing Oct. 1st. Class limited to 35.

Designed for those secretaries and stenographers who desire to develop their abilities and knowledges to enable them to become competent government secretaries. The course will embrace instruction in proper office decorum, sufficient practice to assist the secretarial student in solving definite secretarial problems, training to broaden knowledge and appreciation of government procedures and practices, and development and perfection of the student's ability as a secretary.

Prerequisites: Minimum CAF-2 grade and ability to write at least 96 words per minute.

SHORTHAND DEVELOPMENT

70 to 110 WORDS PER MINUTE—Mrs. Alice Coffman; Mon. and Wed. at 5 commencing Sept. 30th. This is a one semester course and will be repeated in the spring semester; Mon. and Wed. at 5 commencing Feb. 3d. Class limited to 25.

This course is designed for those who desire a review of theory in Gregg shorthand with dictation from 70 to 110 words a minute. Special attention will be given to the acquisition of a large vocabulary of Gregg outlines. Dictation will be graded from business letters and the Congressional Record; legal and technical matter relevant to the work in government offices.

100 to 150 WORDS PER MINUTE—Miss Clara E. Richter; Tues. and Thurs. at 5 commencing Oct. 1st. This is a one semester course and will be repeated in the spring semester, Tues. and Thurs. at 5 commencing Feb. 4th.

This course is designed to develop recording speed in the more technical vocabularies. Subject matter will be selected and graded from the publications of the various bureaus in which members of the class are employed. Students must thoroughly familiarize themselves with the basic theory of the system of shorthand that they write prior to entering the class.

130 to 175 WORDS PER MINUTE—Miss Clara E. Richter; Tues. and Thurs. at 6 commencing Oct. 1st. This is a one semester course and will be repeated in the spring semester, Tues. and Thurs. at 6 commencing Feb. 4th.

Continuation of the 100 to 150 word class with special emphasis on reporting technique.

175 WORDS PER MINUTE AND UP—Miss Clara E. Richter; Mon. and Wed. at 5 commencing Feb. 3d.

Dictation of legal and vocational matter with tests at five-word speed intervals.

INTERNATIONAL SHORTHAND—Mr. Fred Neter; Fri. from 5 to 7 commencing Oct. 4th. Second semester, Fri. from 5 to 7 commencing Feb. 7th.

For beginners and advanced students who are interested in taking up shorthand in German, French, Dutch, Spanish, and Italian. Persons not familiar with the respective languages may obtain preparatory training. Following this course there will be a regular interpreting course with training in the taking of testimony, etc., in shorthand in the languages mentioned above.

SHORTHAND IN SPANISH—Miss Grace M. Bauer; Tues. from 5:30 to 7:30 commencing Oct. 1st.

Study of manual and supplemental dictation, including exercises and business correspondence. (Gregg system used.)

Prerequisite: Knowledge of Spanish.

ADVANCED SHORTHAND IN SPANISH—Miss Grace M. Bauer; Tues. from 5:30 to 7:30 commencing Feb. 4th.

Advanced dictation, including articles and business correspondence.

Prerequisite: Shorthand in Spanish.

1. **PITMAN SHORTHAND SYSTEM**—Mrs. Louise C. Barry; Sat. from 1:30 to 3:30 commencing Oct. 5th. Second semester, Feb. 1st.

A comprehensive course in the principles of Pitman shorthand to enable technical, scientific, and professional students and workers to record research records, addresses and other work with greater speed, accuracy, and ease, and which embraces the necessary practical instruction to equip the student to write accurate Pitman shorthand.

2. **PITMAN SHORTHAND SYSTEM**—Mrs. Louise C. Barry; Tues. and Thurs. at 5 commencing Oct. 1st. Second semester, Feb. 4th.

An advanced comprehensive course for Pitman writers, development of speed and accuracy, dictation of appropriate and illustrative material, standard word signs.

Prerequisites: Pitman shorthand (course 1) or equivalent knowledge of Pitman shorthand.

CORRESPONDENCE COURSE IN PITMAN SHORTHAND SYSTEM—Mrs. Louise C. Barry. Fee \$25, which includes the text.

Full instructions will be furnished the student and his exercises and written work graded and criticized. The instructional fee, which includes all expense, is payable in advance, or in two installments. Checks should be made payable to the Graduate School, The Department of Agriculture, Washington.

Special courses in OFFICE SKILLS.

Given under the direction of Mr. Charles J. McDowell in the Farm Credit Administration, will be continued as needs of the service require. Information regarding these will be furnished by Mr. Milton Hall, Farm Credit Administration.

GENERAL LECTURES

As in previous years special series of popular lectures by outstanding men and women will be given.

Arrangements have been completed for a series by DR. HORNE LL HART elaborating his last series on New Gateways to Creative Living. (October 11-November 15, 1940). Ask for special announcement.

FAMOUS WOMEN OF HISTORY—Miss Mary Sabarth; Mon. from 5 to 6 commencing Oct. 14th. Fee \$6. Second semester, Feb. 3d.

New and original material is presented covering the 18th and 19th centuries. Ask for special circular.

PUBLICATIONS OF THE GRADUATE SCHOOL

	Price	Postage	
		U. S.	Foreign
ON LEAST SQUARES by W. Edwards Deming	\$1.50	3c	15c
ON THE STATISTICAL THEORY OF ERRORS by W. Edwards Deming and Raymond T. Birge	35c	1½c	4½c
ON THE STATISTICAL METHOD FROM THE VIEWPOINT OF QUALITY CONTROL by Walter A. Shewhart, edited by W. Edwards Deming	\$2.50	3c	12c
FACSIMILES OF TWO PAPERS BY BAYES (his famous essay on probab- ility, and a note on divergent series), with commentaries by E. C. Molina and W. Edwards Deming	\$1.00	3c	12c
ADMINISTRATIVE MANAGEMENT by outstanding leaders in that field			
paper binding	75c		
cloth binding	\$1.00	1½c	7½c
CURRENT ECONOMIC PROBLEMS by outstanding leaders in that field	50c 1935/36	4½c	22½c
ELEMENTS OF PERSONNEL ADMINISTRATION by outstanding leaders in that field	50c	1½c	4½c
ADMINISTRATION Four lectures by outstanding leaders in the management field	25c	1½c	4½c
THE ADJUSTMENT OF PERSONALITY by outstanding leaders in that field	50c	3c	12c

Cheques accepted; U. S. and British stamps accepted.

CUT HERE

DEPARTMENT OF AGRICULTURE GRADUATE SCHOOL

REGISTRATION FORM

Persons who are ready to register for any of the courses listed are urged to fill out the following form.. For courses offered in the fall semester, mail or present in person prior to September 21st; for courses offered in the spring semester prior to January 24th. Room assignments are made on the basis of registrations made up through the dates mentioned above; late-comers often necessitate readjustments and create extra overhead, as well as inconvenience to those who have already registered and received their room assignments.

To: Dr. A. F. Woods, Director

The Graduate School, Department of Agriculture, Room 1031
Washington, D. C.

I should like to register for the following courses:

Educational background:

High School

College

(Over)

A cheque for \$_____ is enclosed. (The tuition will be \$12 a semester for two hour a week studies and \$18 a semester for three hour a week studies, except as otherwise indicated. Those who desire college or graduate credits certified to a university or to the Civil Service Commission will pay \$7.50 a credit hour instead of \$6.00 a credit hour.)

Name (Please write or print plainly)

Residence_____Telephone_____

Present position_____Telephone_____

Where employed_____

Do you want college credit for the courses for which you are now enrolling?_____

Where?_____

(A registration card, constituting a receipt, will be mailed to you before classes commence.)

(Over)

1
Ag 854 E

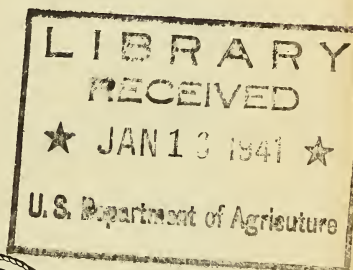
req.

THE DEPARTMENT OF AGRICULTURE GRADUATE SCHOOL

EDUCATIONAL COURSES MAKING
FACILITIES AVAILABLE FOR
STUDY AND RESEARCH IN
THE GOVERNMENT SERVICE

SECOND SEMESTER

1940-41



WASHINGTON

CONTENTS

	Page
GENERAL INFORMATION	3
Biological Sciences, Department of.....	6
Economics and Social Sciences, Department of.	9
Engineering and Mechanical Arts, Department of	21
Language Aids, Department of.....	18
Mathematics and Statistics, Department of....	15
Office Skills, Department of.....	24
Physical Sciences, Department of.....	7
Public Administration, Department of.....	23
Accounting	5
Art	6
Astronomy	8
Chemistry and Micro-Organic Analysis.....	7
Classics (St. John's College Program).....	25
Clerical and Secretarial.....	24
Economics	9
Engineering	21
English	18
Extension Education	6
Foreign Languages	20
Geography	9
Glass Blowing	22
Graphic Presentation	22
History	12
Literature and Drama.....	18
Management (Public Administration).....	23
Mathematics	15
Meteorology	8
Mineralogy	8
Philosophy	13
Photography	23
Physics	7
Political Science	13
Psychology	13
Publications	26
Public Law	14
Shorthand Development	24
Sociology	14
Soil Science	8
Speech	20
Statistics	16
Writing	19

THE DEPARTMENT OF AGRICULTURE GRADUATE SCHOOL

Second Semester Begins January 27, 1941

Fees. A fee of \$6 is charged for each credit hour, except as otherwise indicated (e.g., the fee for a two-credit course is \$12; for a three-credit course \$18). Students who desire credits certified to an educational institution or to the Civil Service Commission must pay an additional \$1.50 a credit hour, payable either at the time of registration or at the time of certification.

Registration. Register in advance—Room 1031, South Building, Department of Agriculture. Registration for the second semester should be completed before January 24.

Partial Payment Plan. Arrangements may be made at the time of registration for paying in two installments, for which there will be an additional service charge of \$1.00 for each course. The first installment of not less than half the full fee, plus the \$1.00 service charge, must be paid at the time of registration. The second and final installment should be paid on or before March 3.

Refunds. Students withdrawing from classes will not be entitled to refunds, except that—

1. When an announced course is not given for want of a sufficient number of students, the fee will be returned in full.
2. When a student is OFFICIALLY transferred out of the Washington area, or is otherwise by official action entirely prevented from attending class, his fees will be refunded in the amount proportionate to the unexpired portion of the semester, provided written evidence of such transfer or action is presented. This does not apply to cases arising out of the student's VOLUNTARY action.
3. When a student is granted permission to withdraw from a class during the first two weeks of the course, his fee, minus a \$3 registration charge, will be refunded.

Refunds are granted on no other basis.

Planning Your Program. Students who want credit certified to a college or university should, whenever possible, arrange their programs with the institution to which credits are to be sent. The latest catalogs of colleges and universities are available in the Graduate School Office. Officers of the School and instructors will be glad to assist students in selecting courses.

Transcripts. Any student working for academic credit should secure from the schools attended a transcript of his academic work and file it with the Secretary of the Graduate School, Mrs. Eva M. Johnson. Students who enroll in courses given in cooperation with American University *and desire credit at American* must file a transcript with that institution and otherwise comply with its rules.

Room Assignments. Room assignments for classes may be obtained from the Director's Office after January 22, or from the Graduate School bulletin board outside Room 1031, South Building.

Inquiries. Inquiries regarding the School should be addressed to Dr. A. F. Woods, Director of the Graduate School, Room 1031, South Building, Department of Agriculture, Washington.

General Lectures. See page 25.

AUTHORITY AND OBJECTIVES

The Congress of the United States has authorized the use of facilities for study and research in the Government departments by qualified individuals, students, and graduates of institutions of learning in the several States and the District of Columbia under such rules and restrictions as the heads of departments and bureaus may prescribe (Joint Res. April 12, 1892, 27 Stat. 395; Deficiency Act of March 3, 1901, 31 Stat. 1010, 1039). Under this authority and the provisions of the Organic Act, a School of Graduate Studies was organized with the approval of the Secretary of Agriculture in 1921 for the benefit of Department employees and such others as are qualified to undertake the work offered.

Executive Order No. 7916 authorizes and directs "the establishment of federal training facilities in and by the Departments and Agencies and by the Civil Service Commission."

Because of the exceptional conditions under which the school operates, it has seemed neither necessary nor desirable to educators within and outside the Government that the school be included on the lists of accrediting associations. The work is of college grade for the levels indicated and is accepted by many of the leading universities when it meets the requirements of the program selected by the students. Graduate programs should be arranged in advance through the dean of the graduate school where the students desire to register for a degree. No courses are given in preparation for Civil Service examinations, but the Civil Service Commission accepts our credits in college subjects as part of the basic work required as prerequisites for taking examinations.

Information regarding administrative and teaching staff and history of the school is available upon request to the Director.

Social Science Reading Room

As an extension of the services of the Agricultural Economics Library, the Division of Statistical and Historical Research, in cooperation with the Graduate School, has opened a Social Science Reading Room in Room 3906 South Building, for employees of the Department of Agriculture and students of the Graduate School. In addition to general books and periodicals in the field of Social Science, books for Graduate School students in the Social Science courses will be on reserve. The Reading Room will be open from 8:30 to 9:00 each morning and from 4:30 to 8:00 each evening, Monday through Friday. Books may be borrowed for overnight study. Admission is by card, which may be obtained from the Graduate School office, Room 1031 South Building.

OFFICE HOURS

9 a. m. to 5:30 p. m.; Saturdays—9 a. m. to 1 p. m.

BUSINESS OFFICE—Room 1031, South Building

TELEPHONE—Extension 5943, Department of Agriculture

OFFICERS

DR. A. F. WOODS, *Director*

DR. ELDON L. JOHNSON, *Administrator*

MRS. EVA M. JOHNSON, *Secretary*

J. J. ACKERMAN, *Treasurer*

DETAILED DESCRIPTION OF COURSES

The asterisk (*) indicates cooperation with American University.
Roman numerals indicate college year levels.

Unless otherwise stated, new students will not be admitted to courses marked "Continuation of fall semester" unless they have had the fall semester's work or equivalent or consent of instructor. Course descriptions for these "continuation" classes are for the entire year except where otherwise stated.

ACCOUNTING

Students specializing in Accounting may obtain a special program sheet

Undergraduate

PRINCIPLES OF ACCOUNTING (II, 3 cr. each sem.)—Mr. Wm. H. Rowe, Dr. Oswald Nielsen, Dr. Allan J. Fisher, Mr. G. Y. Jarvis and Mr. V. W. Bennett. A two-hour **LABORATORY PERIOD** once a week is required unless specially excused by the instructor.

First semester. Mon. and Wed. at 5 commencing Feb. 3d. Laboratory, Mon. 6 to 8 commencing Feb. 10.

Elementary principles of accounting; discussion and problems. At the end of the semester students will be prepared to devise the accounting methods necessary for a small business organization, make the necessary entries in the records, draw up statements at the end of the fiscal year, adjust the accounts for accruals, deferred items, depreciation, etc., and close the books.

Second semester. Tues and Thurs. from 5 to 6 commencing Feb. 4th. Laboratory, Tues. 6 to 8 commencing Feb. 11th. Continuation of first semester covering the more advanced principles of accounting; account classification; the valuation of assets and depreciation policies; manufacturing accounts; partnership accounts; and corporation accounting, particularly the treatment and interpretation of capital stock, surplus, and reserve accounts.

SECOND YEAR ACCOUNTING (III, 3 cr. each. sem.)—Dr. Oswald Nielsen.

Second semester. Fri. from 5 to 8 commencing Feb. 7th. Correction of financial statements and books of account, comparative statements and the analysis of financial statements by means of financial and operating ratios and statements of sources and application of funds, statements of affairs, receivers' accounts, realization and liquidation accounts, home office and branch accounting, and consolidated statements. Considerable emphasis will be given to the solution of problems in connection with such topics.

Prerequisite: First year accounting or equivalent. New students will be admitted.

AUDITING PROCEDURE—(See **CLERICAL AND SECRETARIAL**.)

Graduate and Advanced Undergraduate

***COST ACCOUNTING (IV, V, 3 cr.)**—Mr. Elmer C. Koch; available in 1941-42.

***AUDITING (IV, V, 3 cr.)**—Mr. Theodore B. Nickson; Wed. from 5 to 8 commencing Feb. 5th.

The purposes and types of audits will be studied. Consideration will be given to such problems as the planning and performing of audits, principles and auditing of different types of audits, audit working papers and reports, and responsibility of the auditor.

Prerequisite: Second year accounting.

MATHEMATICS OF FINANCE (IV, V, 2-3 cr.)—Mr. Wm. H. Rowe. To be offered next year, 1941-42.

MUNICIPAL AND GOVERNMENTAL ACCOUNTING—(See **PUBLIC ADMINISTRATION**.)

***ACCOUNTING IN THE FIELD OF LEGAL PROBLEMS**—(See **PUBLIC LAW**.)

***BUSINESS LAW**—(See **PUBLIC LAW**.)

ART

Undergraduate

THE GREAT ERA OF CHRISTIAN ART (III, 2 cr.)—Dr. Fritz Marti; Mon. from 5 to 7 commencing Feb. 3d.

The development of architecture, sculpture, and painting, from the earliest Christian works of art to the Renaissance. Special emphasis will be placed on the connection with social and religious developments. Church architecture will be studied exhaustively. The lectures will be profusely illustrated with slides. Text recommended: *An Outline History of Art. Vol. II: Art of the Middle Ages in Europe, etc.*, by Joseph Pinjoan.

MUSEUM COURSE IN ART APPRECIATION (III, 2 cr.)—Dr. Fritz Marti; time to be arranged to suit all participants, presumably Saturday afternoons; organization meeting at 5 p. m., Mon., Feb. 3d.

Weekly visits to local museums and exhibits, including the Mellon, the Phillips, the Freer, the Corcoran, and the National galleries. Gallery lectures, and student exercises in art criticism both for beginners and for students already acquainted with art. Occasional class room meetings.

INTERIOR DECORATION (I, 1 cr.)—Miss Harriet Garrels; Wed. from 5 to 6 commencing Feb. 5th. Continuation of fall semester. New students admitted. Fee \$6.

How to create backgrounds of good taste and personality—art principles underlying interior decoration.

Discussion of principles of arrangement, color, selection, charm at least expense, the small house, domestic architecture, the apartment, rooms in detail, period styles such as early American, Modern, etc., furniture, rugs, antiques, flower arrangement, what to hang and how to hang it.

EXTENSION EDUCATION

Graduate and Advanced Undergraduate

Open to those with extension teaching experience, or with background of educational training satisfactory to instructor.

EXTENSION METHODS (IV, V, 2 cr.)—Messrs. M. C. Wilson and Barnard Joy; hours to be arranged. Commences Feb. 3d. Room 5534 South Bldg.

Aims and objectives of extension teaching and possible ways of measuring accomplishments in this field are reviewed and critically analyzed. Various means and agencies employed in extension teaching are considered, such as result demonstrations, method demonstrations, meetings, news articles, personal service, bulletins, exhibits, and circular letters. They are evaluated from the standpoint of their teaching functions, adaptability, relative influence, cost, inter-relationship, and general effectiveness.

DEPARTMENT OF BIOLOGICAL SCIENCES

Undergraduate

SYSTEMATIC BOTANY (II, 2 cr. each sem.)—Dr. S. F. Blake; Mon. and Wed. from 5 to 6 commencing Jan. 27th. Continuation of fall semester.

This course is intended to give those with no previous experience in systematic botany an acquaintance with the elementary principles of the subject sufficient to enable them to use the ordinary manuals to advantage. The second semester will be devoted to the identification of wild plants of this region by the use of a manual. One or two short field trips will be held.

Graduate and Advanced Undergraduate

PLANT ECOLOGY (IV, V, 2 cr. each sem.)—Dr. M. B. Waite; Wed. from 5 to 8 for 10 weeks beginning Jan. 8. Continuation of fall semester.

General plant ecology. The ecology of diseases of cultivated crop plants will be stressed.

PLANT BREEDING WITH SPECIAL REFERENCE TO DISEASE RESISTANCE (V)—Dr. F. J. Stevenson. (Offered at two-year intervals; not due until 1942-43.)

Courses in **LANDSCAPE DESIGN** will be available 1941-42.

PLANT BIOPHYSICS (IV, V, 2 cr. each sem.)—Dr. Glenn A. Great-house; Thurs. from 5 to 7 commencing Feb. 6th. Continuation of fall semester.

Course for advanced students and investigators. It will include the methods used to solve particular types of problems. The application of physics and chemistry to biological problems will be emphasized. A general outline of the proposed course may be secured from the Graduate School office.

ELEMENTARY STATISTICAL METHODS IN BIOLOGY AND AGRICULTURE (for field workers)—(See STATISTICS).

PLANT PHYSIOLOGY (IV, V)—Dr. Glenn A. Greathouse. Available 1941-42.

DEPARTMENT OF PHYSICAL SCIENCES

CHEMISTRY AND MICRO-ORGANIC ANALYSIS

Undergraduate

AN INTRODUCTION TO ORGANIC CHEMISTRY (II, 2 cr. each sem.)—Dr. E. P. Clark; Thurs. from 5 to 7 commencing Feb. 6th. Continuation of fall semester.

The fundamental principles of general organic chemistry. Such topics as classification, nomenclature, type reactions, and structure will be considered. Historically important discoveries will be correlated with the development of the subject, and emphasis will be placed upon the treatment of compounds or classes of compounds that are industrially, medically, or biologically important. The first semester will be devoted to the consideration of the aliphatic series; the second semester to the aromatic and heterocyclic series.

PHYSICAL CHEMISTRY (III, 2 cr. each sem.)—Dr. Walter J. Hamer; Tues. from 5 to 7 commencing Feb. 4th. Continuation of fall semester.

Classification of matter; atomic and kinetic theories; atomic structure; valence and molecular structure; solutions; thermochemistry; the phase rule; chemical kinetics and thermodynamics; conduction by electrolytes.

Graduate and Advanced Undergraduate

ADVANCED ORGANIC CHEMISTRY (IV, V, 2 cr. each sem.)—Mr. C. Verne Bowen; Tues. from 5 to 7 commencing Feb. 4th. Continuation of fall semester.

In this course fundamental reactions will be reviewed and elaborated. Newer developments in aliphatic and aromatic chemistry will be presented and recent progress in the chemistry of sterols, vitamins, and sex hormones will be given.

PHYSIOLOGICAL CHEMISTRY (IV, V, 2 cr. each sem.)—Dr. Herbert O. Calvery; Wed. from 5 to 7 commencing Feb. 5th. Continuation of fall semester.

A lecture course on the principles of biochemistry. The course will deal with the chemistry of the proteins, fats, and carbohydrates; the general chemical composition of animal tissues, e. g., muscle, nerve, milk, and blood; a brief discussion of the enzymes of the gastro-intestinal tract; the digestion and absorption of the principal foodstuffs; metabolism of the proteins, fats, and carbohydrates; mineral metabolism; the chemical constituents of the urine; and finally a general discussion of the chemistry and physiology of the vitamins and hormones will conclude the course.

ADVANCED INORGANIC ANALYTICAL CHEMISTRY (IV, V, 2 cr. each sem.)—Dr. James I. Hoffman. Available in 1941-42.

QUANTITATIVE MICRO-ORGANIC ANALYSIS (III, IV, 1 cr.)—Dr. E. P. Clark; Wed. at 5 commencing Feb. 5th. Fee \$6.

A lecture course covering the general principles of organic analysis with special emphasis upon micro- and semi-micro procedures. Consideration will be given the desirability of the several systems under various laboratory conditions, as well as the selection and fabrication of necessary apparatus for each. The lectures will be supplemented with demonstrations of equipment and manipulative procedure.

PHYSICS

Graduate and Advanced Undergraduate

THERMODYNAMICS (IV, V, 2 cr. each sem.)—Dr. F. G. Brickwedde; Thurs. from 5 to 7 commencing Feb. 6th. Continuation of fall semester.

The principle (1st and 2d laws) underlying the interconversion of heat and energy in other forms as mechanical, electrical, and chemical will be studied. From these principles the general equations of thermodynamics will be derived. The equations will be applied to the fields of chemistry, physics, and engineering in which the class is most interested. Subjects that may be considered are heat engines, refrigerating machines, equations of state and gases, temperature scale, thermochemistry, solutions, phase rule, law of mass action, radiation, quantum theory of specific heats, etc.

SELECTED TOPICS IN CHEMICAL PHYSICS (IV, V, 2 cr. each sem.)—Dr. Alfred L. Sklar. Available in 1941-42.

METEOROLOGY

Graduate and Advanced Undergraduate

FORECASTING ANALYSIS (IV, 2 cr.)—Mr. Benarthur C. Haynes; Thurs. from 5 to 7 in Board Room, Weather Bureau, commencing Feb. 6th. Offered in the spring semester only.

Application of modern meteorological theories to forecasting. Displacements of fronts and pressure systems, frontogenesis and frontolysis, frontal and air mass weather, fog and stratus cloud forecasting, thunderstorm forecasting and special weather forecasts.

Prerequisites: Descriptive meteorology or an equivalent general course in meteorology; elementary knowledge of differential and integral calculus. The continuity of the course will follow the first semester of the descriptive meteorology course.

SYNOPTIC WEATHER MAP ANALYSIS (IV, V, 2 cr. each sem.)—Mr. Benarthur C. Haynes; Tues. from 5 to 7 in Room 45, Weather Bureau, commencing Feb. 4th. Continuation of fall semester.

A laboratory course open to not more than twelve students. The first semester covers practice in the analysis of synoptic charts of the surface and an introduction into upper-air analysis. The second semester will be a continuation of surface analysis with added emphasis on various upper-air charts and the application of modern forecasting methods.

CLIMATOLOGY (III, IV, 2 cr.)—Dr. C. Warren Thornthwaite; Tues. from 5 to 7 in Board Room, Weather Bureau, commencing Feb. 4th. Offered in the spring semester only.

Climatology, based on newer concepts of physical meteorology. Problems of agriculture, hydrology, soil conservation, land forms, and human settlement in its relation to climatic or meteorologic conditions will be discussed.

ASTRONOMY

Advanced Undergraduate

GENERAL ASTRONOMY (IV, 2 cr. each sem.)—Mr. A. Hughlett Mason; Tues. from 5 to 7 commencing Feb. 4th. Continuation of fall semester.

The earth as an astronomical object, celestial coordinates, the sun as a star, determination of time, the moon, eclipses, the planets, comets and meteors, the stars, and methods of determining their distances. The galaxy, galactic and extra-galactic nebulae, cosmogony.

MINERALOGY

Graduate and Advanced Undergraduate

MINERALOGY: DESCRIPTIVE and DETERMINATIVE (III, IV, 2-3 cr. each sem.)—Miss Jewell J. Glass; Tues. and Thurs. at 5 commencing Feb. 4th. Registration limited to 12 students. Fee \$15 per semester. Continuation of fall semester.

Inspection of the common rock-forming minerals, in hand specimens, in crystal form, and in rock masses. Descriptive physical properties. External forms, structure, texture, hardness, specific gravity, cleavage, color, etc. A brief review of crystallography, and of the chemical characters of each species. Mode of occurrence and characteristic associations of each mineral. Uses and economic importance. Illustrated lectures and laboratory demonstration of the study of the internal crystalline structure (atomic structure) of minerals by the X-ray and electron diffraction methods, given by eminent workers in that field.

Laboratory: Identification of mineral specimens (100 unknowns); (a) by blowpipe analysis; (b) by qualitative chemical tests. Series of 6 Saturday afternoon field excursions, to be counted as laboratory work.

MICROSCOPICAL PETROGRAPHY (V, 2 cr.)—Dr. Earl Ingerson; Wed. and Fri. from 5 to 7 commencing Feb. 5th.

Continuation of the course on the use of the petrographic microscope. Lectures on the origin, occurrence, properties, and classification of igneous, metamorphic and sedimentary rocks. Laboratory work chiefly study of thin sections of typical rocks.

Prerequisite: Optical mineralogy.

SOIL SCIENCE

Graduate and Advanced Undergraduate

SOILS: THEIR MORPHOLOGY, GENESIS, AND CLASSIFICATION (IV, V, 3 cr.)—Dr. Charles E. Kellogg; Tues. and Thurs. from 5 to 6:30 commencing Feb. 4th.

The nature of soils and the broad principles governing their behavior are first discussed, followed by consideration of soil morphology, formation, and classification. Particular attention is given to the characteristics of the

great soil groups and their genesis in relationship to the physical and biological forces of the environment. The soil geography of the United States is dealt with broadly, but some examples from other parts of the world are used. Throughout the course, the relationships of soil characteristics to agricultural development, soil use and conservation, and patterns of human occupancy are emphasized.

Prerequisites: Freshman chemistry or its equivalent. Previous or collateral reading in plant physiology, geology, geography, and logic would be helpful, but not essential.

SOILS AND PLANNING—SEMINAR (V, 1 cr.)—Dr. Charles E. Kellogg; Fri. at 5 commencing Feb. 7th.

Seminar discussions dealing with the use of the data and technique of soil science in land classification and land-use planning. Present problems of coordination of soil data with those from other disciplines will be dealt with and illustrated with particular examples. Good preparation in soil science desirable.

GEOGRAPHY

Graduate and Advanced Undergraduate

***INTRODUCTION TO METHODS OF QUANTITATIVE GEOGRAPHY (IV, V, 2 cr. each sem.)—Dr. John Kerr Rose; Tues. from 5 to 7 commencing Feb. 4th. Continuation of fall semester.**

Several important sections of the field of geography will be surveyed, including population distribution, agricultural geography, land utilization, and climatology. The general approach will be that of the recognition and definition of problems that can be studied by quantitative technique; survey of quantitative contributions that have been made thereto. Specific application and utility of descriptive statistics, correlations, and sampling techniques. Aerial indices and measures of association applied to data having spatial distribution. The statistical techniques used will be introduced and taught as needed. The second semester extends the work of the first semester into economic and industrial geography with special attention to location theory.

DEPARTMENT OF ECONOMICS AND SOCIAL SCIENCES

ECONOMICS

Dr. Charles F. Sarle, officers of the School, and members of the teaching staff will be glad to assist students in planning programs of study. For prerequisites in these courses consult the instructor.

Undergraduate

- 1. PRINCIPLES OF ECONOMICS (III, 3 cr. each sem.)—Dr. F. L. Thomsen; Mon. and Wed. from 5 to 6:30 commencing Jan. 27th. Continuation of fall semester.**

An examination of the nature, validity, and significance of the "fundamental principles of economics". Designed to give the student the understanding of basic concepts necessary for advanced study in the field of economics and for the better understanding of materials dealt with in applied courses. The relation between economic theory and scientific methods. The organization of the economic system: Production, consumption, exchange, and the distribution of income and wealth. The relation between economic institutions and so-called economic laws. What we know and do not know about the nature and causes of business cycles. International economic relations. Political economic "isms". Although the significance of basic principles will be interpreted in relation to current events and problems, the course is primarily designed to furnish an understanding of the scientific aspects of economics which have continuing application under changing world conditions.

- 2. COTTON CLASSING (II, 2 cr.)—Mr. R. L. Kause, in cooperation with the Cotton Division, Bureau of Agricultural Economics; a ten weeks' course held in the Cotton Division Laboratory on the sixth floor of the Annex Building, 12th and C Sts., S. W., from 4:30 to 5 daily and 1:30 to 3:30 on Saturdays, with permission to substitute the 8:30 to 9 a. m. period daily, commencing April 1st.**

A study of grade, color, staple, and preparation. Registration limited to fifteen.

Graduate and Advanced Undergraduate

- 3. *ECONOMIC THEORY (IV, V, 3 cr. each sem.)—Dr. Howard S. Piquet. (See American University, School of Public Affairs catalog, Econ. 401-402.) Thurs. from 8:10 to 10:40. Audit fee \$22.50; credit fee \$30. Continuation of fall semester.**

This course is designed to aid in meeting the requirements of candidates for the Master's degree in economics. It follows in general outline the more advanced presentation in 501-502. It is open to those who as undergraduates have had adequate preparation in economics.

4. **HISTORY OF ECONOMIC THOUGHT (IV, 3 cr. each sem.)**—Dr. Max J. Wasserman; Mon. and Wed. from 5 to 6:30 commencing Jan. 27th. Continuation of fall semester.

An examination of the principal economic theories from Greek antiquity to the present time in the light of the institutions, customs, and practices which conditioned them.

Prerequisite: Consent of the instructor.

6. ***CURRENT FOREIGN TRADE PROBLEMS AND POLICIES IN RELATION TO AGRICULTURE (IV, V, 3 cr.)**—Messrs. L. A. Wheeler, Robert B. Schwenger and Dr. L. Volin; Tues. and Thurs. from 5 to 6:30 commencing Jan. 28th.

The object of this course is to present for discussion and analysis certain fundamental aspects of United States foreign-trade trends and policies and of the agricultural policies of foreign countries as they relate to United States agriculture.

7. ***SOCIAL AND ECONOMIC HISTORY OF AMERICAN AGRICULTURE (IV, V, 3 cr. each sem.)**—Mr. Everett E. Edwards; Tues. and Thurs. from 5 to 6:30 commencing Jan. 28th. Continuation of fall semester.

Second semester. The agricultural revolution, its elements and significance; policies concerning the public domain since 1862; the westward movement of agrarian settlement since 1850; history and significance of farm implements and machinery; agriculture since 1860 by regions and commodities; transportation and marketing agencies promoting agriculture, including individual leadership, societies, fairs, periodicals, State and Federal departments, education, and sciences; American agriculture during the first World War; postwar readjustments, including cooperation, tenancy, and rural population changes.

9. ***FARM MANAGEMENT (IV, V, 3 cr.)**—Drs. Sherman E. Johnson and Wylie D. Goodsell; Mon. and Wed. from 7:30 to 9 commencing Jan. 27th.

This course considers the most economic combination of resources used in farming, the combination of farm enterprises and their efficient operation on individual farms, and the basis for formulation of farming programs for agricultural areas.

Prerequisite: Production economics or its equivalent.

11. ***ECONOMICS OF COOPERATIVE ORGANIZATION (IV, V, 2 cr.)**—Drs. T. G. Stitts, W. W. Fetrow, and Mr. Harold Hedges; Mon. from 5 to 7 commencing Jan. 27th.

This course deals with the history, philosophy, and economic concepts of the cooperative movement and with practical operating problems of farmers' cooperatives. The group will consider such questions as: What factors make cooperative associations different from other forms of business enterprise? What are the legal bases of cooperation? What are the most effective ways of handling problems of organization structure? Of membership? Of finance? How many farmers best use cooperative principles to improve their economic status? What limitations must be observed? Throughout the course, the place of cooperatives in relation to the handling of particular commodities will be analyzed. There will also be discussion of specific problems concerned with the marketing of farm products and the purchasing of farm supplies.

13. ***PRINCIPLES OF LAND APPRAISAL (IV, V, 2 cr.)**—Dr. P. L. Gaddis; Tues. from 5 to 7 commencing Jan. 28th.

An application of the economics of land value to the practical problems of land appraisal.

15. ***COTTON MARKETING (IV, V, 3 cr.)**—Dr. John W. Wright and specialists in cotton marketing; Tues. and Thurs. from 7:30 to 9 commencing Jan. 28th.

Although primary emphasis will be placed on the marketing system for raw cotton and its functioning through all stages of the distributive process from sale by producers to purchase by spinners and related problems, the course will cover also the manufacturing processes and the organization of the cotton textile industry, the system of distribution of manufactured cotton goods, and the general situation with respect to cotton in the present world economy.

Prerequisites: At least one course in general economic theory and preferably a general course in marketing.

16. ***THE ECONOMIES OF THE NATIONS OF LATIN AMERICA (IV, V, 3 cr. each sem.)**—Dr. Charles F. Sarle; Tues. and Thurs. from 5 to 6:30 commencing Jan. 28th. Continuation of fall semester. New students admitted with consent of instructor.

In the fall semester of this course specialists presented the general physical and institutional basis of the economic life of Latin America, including an appraisal of mineral, forest, and agricultural resources as a background for the second semester.

In the second semester consideration will be given to the economies of the individual countries with emphasis not only on what the present situation is but also on why it is, and also on the development of practical programs for better integrating the economic life of these countries with that of the United States. Specialists with first-hand knowledge of their respective countries will participate in the discussions. New students with some background in Latin American affairs will be permitted to register for this second semester with consent of the instructor.

Prerequisites: First semester, consent of instructor, or American University course in Current Latin American Trade Problems.

19. ***TAXATION AND PUBLIC FINANCE (IV, V, 3 cr.)** (Spring sem.)—Dr. Fritz Karl Mann. (See American University catalog, Econ.-430.) Audit fee \$22.50; credit fee \$30.
21. ***THE GEOGRAPHY OF NATIONAL DEFENSE (IV, V, 3 cr.)** (Spring sem.)—Dr. M. J. Proudfoot. (See American University catalog, Econ.-467.) Audit fee \$22.50; credit fee \$30.
23. ***THE INDIVIDUAL WORKER AND THE LAW (IV, V, 3 cr.)**—Dr. David Ziskind; Mon. 7:30 to 10:30 commencing Jan. 27th.

The progress of social legislation designed to improve labor standards. Legislation on child and woman labor, safety and health, accident compensation, wage payment and collection, minimum wages, unemployment insurance, and old age pensions. The administrative procedures before such agencies as the National Labor Relations Board, the Social Security Board, the National Mediation Board, the Division of Public Contracts, the Fair Labor Standards Division, and the various State labor departments.

25. **THE PROBLEM OF UNEMPLOYMENT (IV, V, 3 cr.)**—Dr. David Ziskind; Wed. from 6 to 9 commencing Feb. 5th.

The analysis of unemployment primarily as it has manifested itself in this country during the past several years. An evaluation of the efforts to overcome the causes and effects of unemployment. (Seminar and discussion.)

- *AGRICULTURAL ECONOMICS (IV, 3 cr.)**—Dr. O. C. Stine. (See A. U. Catalog.) Mon. 7:30 to 10:00. Audit fee \$22.50; credit fee \$30.

- WARTIME PRICE CONTROL (IV, V, 2 cr.)**—Dr. Richard A. Kahn; Wed. from 5 to 7 commencing Feb. 5th.

A course on the types and purposes of wartime price control; effects of governmental purchases on prices; effects of the draft, of war finance, and of trade restrictions on prices. Methods of forecasting price movements in wartime will be studied.

- FUNDAMENTAL PROBLEMS OF HOUSING (IV, 2 cr.)**—Mr. Bertram M. Gross; Mon. from 7:30 to 9:30 commencing Feb. 3d.

Against the background of actual housing conditions faced by all income groups in America, this course will present the fundamental problems of planning, financing, land, construction, management and taxation. It will show the various methods through which speculative builders, investment builders, and public builders solve—or fail to solve—these problems and will analyze the role of the federal housing agencies. The conflicting interests involved will be studied. Attention will be given to the everyday problems of the average housing consumer.

A number of the classes will be addressed by representatives of the National Defense Advisory Commission, the Federal Housing Administration, the U. S. Housing Authority, the Federal Home Loan Bank Board, and various real estate, banking and construction organizations.

- FARM TENANCY IN THE UNITED STATES** (See SOCIOLOGY).

Graduate

26. ***CONTEMPORARY ECONOMIC THOUGHT** (Advanced Economic Theory) (V, 3 cr. each sem.)—Dr. Howard S. Piquet. (See American University catalog, Econ.-501-502.) Thurs. 5 to 7:30. Audit fee \$22.50; credit fee \$30. Continuation of fall semester.

28. ***ECONOMICS OF IMPERFECT COMPETITION (V, 3 cr.)**—Dr. Michael T. Wermel; Mon. and Wed. from 7:30 to 9 commencing Jan. 27th.

This course will commence with a critical re-examination of the basic premises underlying the traditional theory of price determination, as an introduction to an intensive study of the newer theoretical techniques, developed during recent years, for the analysis of prices under conditions which fit neither the assumptions of "perfect competition" nor of "pure monopoly" and which have been described as conditions of "monopolistic" or "imperfect competition." (Joan Robinson—*The Economics of Imperfect Competition*; Edward Chamberlin—*The Theory of Monopolistic Competition*.) The usefulness and applicability of this theoretical apparatus will be tested by a study of actual institutional practices, of price determination in specific markets, where admittedly neither "perfect competition" nor "pure monopoly" prevails. (A. R. Burns—*The Decline of Competition*; Walton Hamilton and Associates—*Price and Price Policies*.)

30. ***AGRICULTURAL PRICE ANALYSIS (V, 3 cr.)**—Dr. F. L. Thomsen; Tues. and Thurs. from 5 to 6:30 commencing Jan. 28th.

A review of the supply and demand factors affecting agricultural prices. Time elements in prices. Research methods and materials in price analysis. Index numbers. Uses and limitations of multiple correlation in price analysis. Seasonal variation. Trends and cycles. A critical evaluation of

progress to date in price analysis. Price forecasting. Chart reading. The use of analytical devices in throwing light upon the probable effects of agricultural legislation designed to influence farm prices and income, and in promoting the successful administration of such measures.

31. ***SEMINAR: AGRICULTURE UNDER CHANGING WORLD CONDITIONS (V, 2 cr. each sem.)**—Dr. O. C. Stine; Thurs. from 7:30 to 9:30 commencing Jan. 30th. Continuation of fall semester.

The problems will include current economic problems arising in connection with agricultural programs and the World War and probable post-war conditions. Each student will be expected to select at least one major problem with reference to which he will specialize for one semester or for the year. He will be expected to read extensively and present occasional reports to the seminar. The field of problems to be covered in the course of the year will be determined largely by the special interests of the students.

- ECONOMICS OF PURCHASING POWER (V, 3 cr.)**—Dr. Max J. Wasserman; Fri. from 7 to 10 commencing Feb. 7th.

This is an advanced course in economic theory and policy covering the theoretical foundations of present economic policy. Stress will be laid on techniques of economic analysis.

Courses to be offered in 1941-42

32. ***ECONOMIC PROBLEMS IN AGRICULTURAL PROGRAM PLANNING (IV, V, 3 cr.)**—Dr. Bushrod W. Allin and Mr. D. A. Fitzgerald; fall 1941.

33. ***ECONOMIC PROBLEMS IN REGIONAL AND LOCAL PLANNING (IV, V, 3 cr.)**—Dr. Bushrod W. Allin and associates; spring 1942.

34. ***THEORY AND PRINCIPLES OF AGRICULTURAL MARKETING (V, 3 cr. each sem.)**—Drs. F. V. Waugh, A. C. Hoffman, and Mr. R. O. Been.

HISTORY

Undergraduate

- HISTORY OF THE UNITED STATES (I, II, 2 cr. each sem.)**—Dr. W. M. Gewehr; Thurs. from 5 to 7 commencing Feb. 6th. Continuation of fall semester. New students admitted.

This is intended to offer a survey of American history from the time of the Revolution to the present. The period through the Civil War will be studied the first semester followed by a survey of American history since 1865 the second semester. The second semester's work may be taken as a unit by students who enter the course at that time but it is advisable to treat the year's work as a unit.

- HISTORY OF MODERN EUROPE (III, 2 cr.)**—Mr. Simon Krixtein; Wed. from 5 to 7 commencing Feb. 5th.

This course is designed to give the student knowledge of the underlying forces dominant in the development of modern Europe from 1870 to the present time, serving as a historical background for better understanding of the great international crises of this generation—the last world war and the present European war.

- RECENT HISTORY OF THE UNITED STATES**—Dr. W. M. Gewehr. Available in 1941-42.

Graduate and Advanced Undergraduate

- WORLD POLITICS (III, IV, 2-3 cr.)**—Dr. W. M. Gewehr; Tues. from 5 to 7 commencing Jan. 28th.

A survey of world affairs and international relations. Such topics will be considered as the origins of the World War of 1914-18, the Versailles Conference and the treaties that brought no peace; revolutions in Germany and Russia; the conditions that gave rise to Mussolini and Hitler; the nature of Naziism, Fascism and Communism; the breakdown of the peace machinery; the war; basic issues in the Far Eastern situation; the transformation of Turkey, Balkan and Baltic problems; why Europe fights another war.

- LATIN AMERICAN HISTORY (IV, V, 2 cr. each sem.)**—Dr. Ernesto Galarza; Fri. from 5 to 7 commencing Feb. 7th. Continuation of fall semester.

The lectures and discussions will deal with the main periods of the evolution of Latin America, stressing the social and economic aspects of change. The aim of the course will be to give a broad background which will enable the student to better and more clearly interpret the role of the twenty American republics in contemporary world affairs.

POLITICAL SCIENCE

Graduate and Advanced Undergraduate

***LATIN AMERICA AND THE UNITED STATES (IV, V, 2 cr. each sem.)**—Mr. Philip Leonard Green; Mon. from 5 to 7 commencing Jan. 27th. Lectures and discussions in Spanish. Continuation of fall semester. Open to new students with consent of instructor.

This course aims to provide an opportunity to achieve greater facility in Spanish while acquiring useful and interesting information concerning the civilization to which that language is a key, as well as knowledge regarding our relations with the region commonly called Latin America. The course is open to anyone interested in that field, whose command of Spanish is sufficient to enable him to follow lectures in that language. The first semester was devoted to a consideration of racial, geographic, economic and political influences which have conditioned the development of Latin American thought and action.

The second semester will describe important trends in relations among the Latin American countries themselves and between them and the United States, from early times to the Havana Conference. It will not confine its attention to Pan American congresses and other official activities; it will also deal with significant unofficial movements in this field and will endeavor to present objectively, forces which have militated for and against inter-American amity.

LATIN AMERICAN CIVILIZATION (IV, V, 2 cr.)—Mr. Philip Leonard Green; Wed. from 5 to 7 commencing Jan. 29th. Lectures and discussions in English.

This course is designed to provide a comprehensive introduction to the life and customs of the peoples commonly called Latin American. It will be largely devoted to considering the racial, geographic, economic and political influences which have shaped the development of Latin American thought and action. It will also deal with youth movements, with factors of unity and disunity among Latin Americans and with their contributions in the arts, literature, social sciences and other phases of human activity.

INTERNATIONAL RELATIONS (IV, V, 2-3 cr.)—Dr. Montell Ogdon; Tues. from 5 to 7 commencing Feb. 4th.

A lecture course designed to acquaint the student with the problems of international law and relations, economic defense and total warfare, neutrality, termination of war, international agreements, reconstruction of the international community.

CONGRESSIONAL PROCEDURE (IV, V, 3 cr.)—Dr. Floyd M. Riddick; Tues. from 5 to 8 commencing Feb. 4th.

This course includes a comprehensive study of parliamentary procedure and party organizations and manipulations as recognized and utilized in the House and Senate of the United States Congress. General principles of parliamentary law as utilized by all deliberative bodies are reviewed. All possible courses a bill might take and all possible ways of disposing of a bill from time of introduction to passage or defeat are considered.

PHILOSOPHY

Graduate and Advanced Undergraduate

AMERICAN PHILOSOPHY (IV, V, 2 cr.)—Dr. Fritz Marti; Wed. from 5 to 7 commencing Feb. 5th.

A survey of American thought from Colonial times to the present. Informal lectures will introduce the student to the ideas which helped to form the American mind. Students working for credit are required to read short selections from the writings of the main thinkers. Students who desire to read deeper into some specific author are welcome to report on their findings in class; this would help the discussions without turning the course into a display of technicalities.

PSYCHOLOGY

Graduate and Advanced Undergraduate

PSYCHOLOGY OF THE UNCONSCIOUS (IV, V, 2 cr.)—Dr. Paul Kaufman; Wed. from 5 to 7 commencing Jan. 29th.

The first part of the course surveys the theories of the unconscious mind, as developed by Freud and Jung, and analyzes the importance of such theories in the understanding of human nature. The second part studies other planes of consciousness which have recently become the subject of systematic exploration; extra-sensory perception; intuition, and its role in creative activities, including invention; the "collective unconscious" (as described by Jung); and awareness of "high dimensions". Simple experiments and exercises will supplement the theoretical study, to aid in extending the range of individual consciousness, and thus contribute to practical self-development.

INTRODUCTION TO PERSONNEL COUNSELING (IV, V, 2 cr.)—
Dr. Paul Kaufman; Tues. from 5 to 7 commencing Feb. 4th.

A survey of the experience of counseling on personal problems and on adjustment to daily work, as developed in the fields of business and industry and of social agencies, for application to the conditions of employment in public service.

Following the plan of a seminar, the course undertakes to formulate the philosophy, principles, and methods of a counseling program as an implement of a progressive personnel relations policy. Analysis will be made of the common maladjustments of normal people and of methods of solution. Study will be made of the practical adaptation of organized counseling to the conditions of public administration.

SOCIAL PSYCHOLOGY (IV, V)—Dr. Paul Kaufman. Available in 1941-42.

PUBLIC LAW

Graduate and Advanced Undergraduate

***ACCOUNTING IN THE FIELD OF LEGAL PROBLEMS (V, 2 cr. each sem.)—Mr. Mark S. Massel; Tues. from 5 to 7 commencing Feb. 4th. Continuation of fall semester.**

This course is designed to present significant accounting concepts in the field of legal problems. It will include a general exposition of accounting methods in correlation with pertinent legislation, administrative rulings, and case material.

Purposive character of accounting: Balance sheets, assets, liabilities, capital. Income and profit and loss statements. Reserves and deferred assets. The various types of accounts will be analyzed as problems in accounting methods and in various legal fields, such as stockholders' suits, income bonds, patent suits, income taxes, property taxes, fraud, estates, public utility regulation and reorganizations. Differences in the interpretation of accounts in the various legal fields will be stressed.

***BUSINESS LAW (IV, V, 3 cr. each sem.)—Mr. Walter H. Young; Tues. from 5 to 8 commencing Feb. 4th. Fee \$22.50. Continuation of fall semester.**

THE INDIVIDUAL WORKER AND THE LAW (See ECONOMICS).

SOCIOLOGY

Graduate and Advanced Undergraduate

***THE CULTURAL REGIONS OF THE UNITED STATES (IV, V, 3 cr.) (spring semester)—Drs. Carl C. Taylor, John Provinse, and Paul Johnstone; Mon. and Wed. from 5 to 6:30 commencing Feb. 3d.**

This course will continue the study of the cultural regions of the United States for which the groundwork was laid in the fall semester in broad outline, and will study in detail the characteristics of the various regions and subregions and their inter-relationships, including settlement patterns, social organizations and institutions, prevailing ideologies, modes and folkways, and dominant attitudes and opinions of the people who live in the rural areas of these cultural regions.

***SEMINAR IN POPULATION PROBLEMS (IV, V, 3 cr. each sem.)—Dr. Conrad Taeuber; Mon. from 7 to 10 commencing Feb. 3d. Continuation of fall semester.**

The major shifts of population within the United States, rural to urban and urban to rural. The Western movement shifts in population from South to North. Concentration of population within a few areas. The relation of population movements to economic resources and conditions.

***RURAL COMMUNITY ORGANIZATION (IV, V, 2 cr.) Dr. D. Ensminger; Mon. from 7:30 to 9:30 commencing Feb. 3d.**

The role of the community in action and planning programs; the historical background of communities in the various regions of the United States and in other countries; community organization; leadership and means of developing it.

FARM TENANCY IN THE UNITED STATES (IV, V, 3 cr.)—Dr. William T. Ham and Mr. Marshall D. Harris; Fri. from 5 to 8 commencing January 31st.

This course deals with the types of agricultural land tenure, their extent and distribution, also with the economic and social factors underlying the growth of tenancy and the characteristics of the various tenure groups. The problems associated with tenancy are analyzed together with the programs for dealing with them that have been developed in the United States and abroad.

***RURAL SOCIAL PSYCHOLOGY (V, 2-3 cr.)**—Dr. Carl C. Taylor;
Thurs. from 5 to 7 commencing Jan. 30th.

This course deals with the psychology and social psychology of rural groups—communities, institutions, farmers' organizations, and rural classes; with the customs, traditions, and folkways of rural peoples; and with the interactions between rural and urban cultures. It gives special consideration to what may be called the folklore of rural society, and the influence of farm practices and relative isolation on the attitudes, opinions, and philosophies of farm people. Specific topics such as suggestion, imitation, public opinion, farmer pressure groups, and farmers' movements will be discussed.

Prerequisites: Either one course in social psychology, or one course in sociology and one course in psychology.

CONTEMPORARY SOCIAL THEORY (IV, V, 3 cr.)—Dr. Chas. P. Loomis; available fall semester, 1941-42.

THE HISTORY OF SOCIAL THEORY (IV, V, 3 cr.)—Dr. Chas. P. Loomis. Available in the fall-semester of 1941-42.

THE RURAL COMMUNITY (IV, V, 2 cr.)—Dr. D. Ensminger. Available in the fall semester of 1941-42.

DEPARTMENT OF MATHEMATICS AND STATISTICS

MATHEMATICS

The mathematics and statistics courses were planned and arranged by
Dr. W. Edwards Deming.

Undergraduate

2. **TRIGONOMETRY AND ANALYTIC GEOMETRY (I, 3 cr.)**—Mr. Harry J. Winslow; Tues. and Thurs. from 5 to 6:45 commencing Feb. 4th. Offered every year, in the spring semester only.

Definitions in trigonometry; identities; complex numbers; DeMoivre's theorem; trigonometric equations. The study of analytic geometry will include the line, conic sections, and some other plane curves, polar coordinates families of curves with one or more parameters. Parametric equations of curves. Radical axis. Graphic solution of equations. Some three-dimensional geometry.

Prerequisite: Mathematics 1 or equivalent.

- 3, 4. **CALCULUS (II)**—Dr. W. Edwards Deming. Offered in alternate years; due again in 1941-42.
5. **HIGHER ALGEBRA (III)**—Dr. E. J. Finan; offered in alternate years; due again in 1941-42.
6. **COORDINATE GEOMETRY AND VECTORS (III)**—Dr. S. B. Littauer; offered in alternate years; due again in 1941-42.

Graduate and Advanced Undergraduate

- 7, 8. **ADVANCED CALCULUS (IV)**—Not offered this year.
- 11, 12. **ANALYTIC MECHANICS (V)**—Dr. F. G. Brickwedde. Offered in alternate years; due again in 1941-42.
14. **INTERPOLATION AND FINITE DIFFERENCES (V)**—Dr. W. Edwards Deming. Offered every four years; due again in 1941-42.
- 15, 16. **DIFFERENTIAL EQUATIONS (V)**—Offered every fourth year; due again in 1941-42.
- 17, 18. **LINEAR ALGEBRA (V, 2 cr. each sem.)**—Mr. M. A. Girshick; Mon. from 5 to 7 commencing Jan. 27th. Offered every third year. (This course is a prerequisite for statistics courses 29, 30, 31.) Continuation of fall semester.

Determinants. Theory of linear dependence. Linear equations, homogeneous and non-homogeneous. Matrix algebra; calculation of the inverse matrix, application to linear equations. Linear transformations. Quadratic forms; the matrix and discriminant; reduction of a quadratic form to a sum of squares; characteristic equation; definite and indefinite forms. Pairs of quadratic forms, reduction to normal form. Properties of polynomials. Invariants, covariants, half-invariants, annihilators; canonical formation of binary cubics and quadratics. Symmetric functions. Elementary divisors.

19, 20. THE THEORY OF INFINITE PROCESS (V)—Dr. C. Winston. Offered every third year; due again in 1942-43.

21, 22. THE THEORY OF FUNCTIONS (V, 2 cr. each sem.)—Dr. C. Winston; Tues from 7 to 9 commencing Feb. 4th. Offered every fourth year. (This course is a prerequisite for the course in the Characteristic Function, Statistics 33, 34, to be offered next year.) Continuation of fall semester.

Theorems on limits. Continuous and discontinuous functions. The derivative. Expansion of functions in power series. Riemann integration. Some point set theory and extensions of integration. Functions defined by series and by integrals. Differentiation and integration of series. Differentiation of integrals. Classification of functions. Line, surface, and volume integrals. Greene's theorem. Mapping; transformations. Contour integration. Some Fourier series and the Legendre polynomials. The Bernoulli and Euler numbers. The Bernoulli summations. The Euler-Maclaurin summation. The Gauss formula for quadrature. The Fourier integral. The complete and incomplete Gamma and Beta functions. Incomplete summation of the binomial expansion. Elliptic functions and integrals.

STATISTICS

PREFATORY NOTE

In conjunction with formal courses in statistics, the student is earnestly urged to pursue studies in some branch of science and in philosophy; such adjuncts constitute intangible prerequisites to progress in statistical inference. Mathematics in various degrees, both as a tool and as a mode of thought, is indispensable to the study of statistics, and it is a rule that students working for credit in any course must come prepared with the stated mathematical prerequisites; however, for students who wish to learn the routine of certain statistical calculations, certain courses below are offered without mathematical requirements. It should be borne in mind that any course, statistical or otherwise, necessarily receives its character from the instructor; wherefore students planning to undertake work in statistics are advised to look forward to a well-rounded program, not to be curtailed until a number of points of view have been acquired. The Director and other members of the staff will be glad to assist students in drawing up programs of study.

SEMINARS IN STATISTICS. Meetings are held twice monthly under the direction of Dr. Deming. Membership is limited to people who can contribute original work or surveys of journal articles. This is not a credit course, and no fee is charged. Application should be sent in writing to the Director.

Undergraduate

1, 2. GRAPHIC METHODS APPLIED TO RESEARCH ANALYSIS (I, 2 cr. each sem.)—Mr. R. G. Hainsworth; Tues. and Thurs. from 5 to 7 commencing Jan. 28th. Continuation of fall semester. Fee \$15.

Second semester. Maps: how to interpret them; when and how to use them; their preparation and adaptability; examples of data as applied to statistical and geographical maps. Actual working examples of multiple dot, circle, pie diagram, cross hatch, line, basic outline, and typographic and physiographic types will be given.

3. INTRODUCTION TO STATISTICAL ANALYSIS, 1st half.

SECTION B (I, 2 cr.)—Dr. Richard O. Lang and Mr. R. L. Funkhouser; Thurs. from 5 to 7 commencing Jan. 30th.

This is a non-mathematical elementary course designed for statistical clerks who wish to become familiar with the more common statistical terms and formulas, and who wish to learn how to lay out the forms for machine calculations. Methods of checking calculations will be emphasized. The course will include the presentation of data and the results of calculations in tables and charts.

No prerequisites. (See NOTE on page 17)

SECTION C (II, 2 cr.)—Dr. Solomon Kullback; Tues. and Thurs. from 5 to 6 commencing Jan. 28th.

This is designed for students of business and economics. The collecting of economic and census data; the presentation of data in tables and graphs; different kinds of averages; measures and significances of dispersion; elementary principles of sampling; introduction to index numbers and time series. Attention will be paid to the preparation of formulas for machine calculations.

Prerequisites: Mathematics 1 and 2. (See NOTE on page 17.)

4. INTRODUCTION TO STATISTICAL ANALYSIS, 2d half.
SECTION B (I, 2 cr.)—Dr. Richard O. Lang and Mr. R. L. Funkhouser; Thurs. from 5 to 7 commencing Jan. 30th.

Non-mathematical—a continuation of Course 3, Section B. Problems in the relations between two variables; association, correlation, and regression. Some elementary aspects of sampling.

SECTIONS C and D (II, 2 cr.)—Mr. Sidney Wilcox; Tues. and Thurs. from 5 to 6 commencing Jan. 30th.

This is a continuation of Course 3, Sections C and D. Problems in the relations between two or more variables. Association, correlation, and regression, leading into multiple and partial correlation. Introduction to the analysis of variance and its relation to correlation. The presentation of data. Formulas will be put into form for machine calculation.

Prerequisite: Statistics 3, mathematics 1 and 2. (See *NOTE* below.)

NOTE. There is necessarily a considerable amount of calculation in the work of Sections B, C, and D. Students who do not have access to a calculating machine, or who require training in the operation of such machines, should register also in Course 5, *MACHINE CALCULATION*.

5. MACHINE CALCULATION (II, 1 cr.)—Mr. Donald W. Geesa; Wed. from 5 to 7 in Room 7311 Farm Credit Building, commencing Feb. 5th. Registration limited to 18. Fee \$9.

Simple operations on different kinds of calculators; treatment of decimal points; extraction of roots, cumulative moment processes with tape machines; short-cuts and checks; adaptation of formulas to machine calculation.

Prerequisite: High school algebra and statistical experience.

6. STATISTICAL APPLICATIONS OF TABULATING EQUIPMENT (II, 1 cr.)—Mr. Milton Kaufman; Wed. from 7 to 9 commencing Feb. 5th. Offered in the spring semester only. Fee \$9.

The punch card method. The functions of the principal machines. The instruction will cover the actual operation and wiring of all types of tabulating equipment, as well as the theory of their use in statistical work. The use of cards to obtain sums of squares and cross-products in correlation and curve fitting will be demonstrated.

8. CORRELATION ANALYSIS (III, 2 cr.)—Mr. C. M. Purves; Wed. and Fri. at 5 commencing Feb. 5th. Offered in the spring semester only.

The application of advanced correlation methods to practical problems, particularly those involving time series. Various methods including mathematical and freehand multiple curvilinear correlations, use of logarithms and first differences and joint correlation will be applied to specific problems. Emphasis will be placed upon the limitations of correlation in analyzing problems including time series, and the tests of significance of results obtained.

Prerequisites: Statistics 1, 2, and 5.

Graduate and Advanced Undergraduate

9, 10. GRAPHIC CORRELATION (IV, 2 cr. each sem.)—Mr. Louis H. Bean; Mon. from 5 to 7 commencing Feb. 3d. Continuation of fall semester.

Theoretical examples of graphic correlation, followed by practical applications in economics and other fields. The distinctions between the formal mathematical method, the formal graphical method (Ezekiel), and the short-cut method (Bean). Problems concerning the number of variables of inter-correlation, and other aspects of the adequacy and reliability of results.

11, 12. INTERMEDIATE STATISTICS (IV, V, 2 cr. each sem.)—Dr. William G. Madow; Thurs. from 5 to 7 commencing Jan. 30th. Continuation of fall semester.

Second semester. The distribution of correlation coefficients. The tetrad difference. Factor analysis (Hotelling, Thurstone, Holzinger). The sampling theory of roots of determinantal equations. Canonical correlation. Discriminant functions. Rank correlation.

Prerequisites: Calculus, and introductory statistics.

14. THEORY OF PROBABILITY (IV)—Mr. M. A. Girshick; offered every three years. Due again in 1942-43.

16. ELEMENTARY STATISTICAL METHODS IN BIOLOGY AND AGRICULTURE (Correspondence course for field workers)—Conducted by Dr. F. M. Wadley, Bureau of Entomology and Plant Quarantine. Fee \$15. Registration will be open beginning Feb. 1st; work may be begun at any time during the year unless the class becomes full. Non-credit.

This course uses Snedecor's textbook, *Statistical Methods* and follows its outline largely but not absolutely. Each of the 15 lessons consists of a discussion, a textbook assignment and a series of questions and problems. The student reports on these and also may discuss individual problems. The reports are returned with corrections and comments. Subjects discussed include simple variation, regression and correlation, analysis of variance and covariance, chi-square, multiple and curvilinear correlation, applications to sampling and experimental design. Practical application of methods is kept to the front. Facility in the use of arithmetic and simple algebra is necessary. Write for special information circular. A limited number of registrations can be accommodated.

17, 18. **THE INTERPRETATION OF STATISTICAL CALCULATIONS** (V, 2 cr. each sem.)—Mr. Alexander Sturges; Mon. from 5 to 7 commencing Feb. 3d. Continuation of fall semester.

Second semester. The selection and use of statistical tests. The illustrative problems will deal with single and multiple attributes. Time series will be discussed in the light of some new methods.

Prerequisites: Statistics 3 and 4, Mathematics 1 and 2.

19, 20. **ADJUSTMENT OF OBSERVATIONS** (V, 3 cr. each sem.)—Dr. W. Edwards Deming; Thurs. from 7 to 10 commencing Feb. 6th. Offered every four years. Continuation of fall semester.

Second semester. An introduction to statistical inference. The necessity for sampling. The theory of errors. Real sampling and mathematical sampling. Likelihood, confidence intervals, Bayes' rule and Laplace's extension. Shewhart's criterion of randomness. Statistical control. The interpretation of sampling data; common impediments to the application of statistical theory. Special attention to the operational definitions of Shewhart, his criterion of meaning, his rules for the presentation of data, and his methods of quality control. The consumer-purchase risk. Distinction between prediction and "estimation."

Prerequisites: Calculus and two introductory courses in statistics, or the equivalent.

21. **LEAST SQUARES** (V)—Dr. W. Edwards Deming; offered every four years. Due the fall semester of 1941-42.

26. **SAMPLING METHODS IN SOCIAL AND ECONOMIC DATA** (V, 2 cr. each sem.)—Messrs. J. Stevens Stock and Lester R. Frankel; Tues. from 5 to 7 commencing Feb. 4th. Offered every two years.

Theory, history, and present day applications of the representative method. Accuracy and precision. Fallacies of the total count. Practical problems involved in these selections of the sample. Sampling without replacement. The analysis of variance in making estimates of precision. Choice of sampling units. Stratification; principal components.

Prerequisites: Mathematics 1, statistics 3, 4, 8, or equivalent. Calculus required for graduate credit.

29, 30. **MULTIVARIATE ANALYSIS** (V)—Mr. M. A. Girshick; offered every three years. Due in 1941-42. This course follows the one in Linear Algebra (Math. 17, 18).

31. **ANALYSIS OF VARIANCE** (V)—Mr. M. A. Girshick; offered every three years. Due again in 1942-43. This, along with the courses in Linear Algebra (Math. 17, 18) and Multivariate Analysis (Stat. 29, 30) form a three year cycle.

33, 34. **THEORY AND APPLICATION OF THE CHARACTERISTIC FUNCTION** (V)—Dr. Solomon Kullback. To be offered next year and every three years.

DEPARTMENT OF LANGUAGE AIDS

ENGLISH

Undergraduate

COMPOSITION AND RHETORIC (I, 2 cr.)—Dr. Susan E. Harman; Thurs. from 5 to 7 commencing Feb. 6th. Continuation of fall semester. New students admitted.

First quarter freshmen English. An introductory course in writing and English usage, designed especially for those who need a course preparatory to the more advanced English courses. Special attention will be given to the fundamental principles and mechanics of good writing—grammar, punctuation, spelling, etc.

DESCRIPTIVE ENGLISH GRAMMAR (III, 2 cr.)—Dr. Susan E. Harman; Mon. from 5 to 7 commencing Feb. 3d.

A course in grammatical principles, stressing sentence structure and correct English form. Students are required to analyze sentences by diagram and to correct examples of bad English.

VOCABULARY BUILDING AND DICTIONARY STUDY (II, 2 cr.)—Mrs. Sallie M. Pease; Thurs. from 5 to 7 commencing Feb. 6th.

A course designed to help writers and speakers to express their ideas clearly and attractively.

LITERATURE AND DRAMA

Undergraduate

HISTORY OF ENGLISH LITERATURE (II, III, 2 cr.)—Dr. Susan E. Harman; Wed. from 5 to 7 commencing Feb. 5th.

A historical study of English literature from Beowulf to Dryden. Open to students who have had composition and rhetoric.

WORLD DRAMA (III, 2 cr.)—Dr. C. H. McReynolds; Tues. from 5 to 7 commencing Feb. 4th.

Beginning with modern English and American drama, the course deals with the best plays of various ages and nations. Dramas are read, then discussed and analyzed.

Graduate and Advanced Undergraduate

INTRODUCTION TO SPANISH AMERICAN LITERATURE (III, IV, 2 cr.)—Dr. Madaline W. Nichols; Thurs. from 5 to 7 commencing Feb. 6th.

The general literary history of Spanish America, with intensive study of leading literary personalities and of their works. All lectures will be in English; reading may be done either in Spanish or in English translation.

MUSIC AND LITERATURE APPRECIATION (III, IV)—Miss Cecile Willink. Available in 1941-42.

SELECTIONS FROM WORLD LITERATURE (III, IV, 2 cr.)—Dr. C. H. McReynolds; Fri. from 5 to 7 commencing Feb. 7th.

Selections from the best literature of various ages and countries are read and discussed. The course consists of study, analysis, and appreciation of ideas and artistic conceptions as set forth by the greatest geniuses of all time—their philosophy of life and its significance to life today. Among the writers included are Tolstoy, Boccaccio, Dante, Voltaire, Socrates, Plato, Mohammed, Aristotle, Machiavelli, Cervantes, Hugo, Homer, Ovid, Nietzsche, Buddha, Rousseau, Goethe, Ibsen, Vergil, Chekhov, Moliere, Horace, Petrarch, and others. (English and American literature not included.)

DRAMATIC SPEECH (IV, 2 cr.)—Dr. C. H. McReynolds; Wed. from 5 to 7 commencing Feb. 5th.

A laboratory course, dealing with the dramatic elements in speech. It gives training through work on sketches, monologs, scenes, and speeches. Such elements as pause, action, improvisation, pantomime, ensemble, contrast, contact, and voice are emphasized. Each member of the class takes an active part at every session.

PLAY WRITING (IV, V, 2 cr.)—Miss Rebecca Dial; Tues. and Fri. from 5 to 6 commencing Feb. 4th.

Analysis of the one-act play; technique and practice in creative writing; selecting the plot germ; arrangement of the setting, development of plot, characterization, and dialogue. Individual criticism of scripts and preparation of the manuscript for the producer. Opportunity afforded for production of the most suitable scripts in cooperation with the Department "Players."

PLAY PRODUCTION (IV, V, 1 cr.)—Miss Rebecca Dial; Tues. from 6 to 7 commencing Feb. 4th.

Selecting a play for production, casting, and technique of producing. This course is designed especially to help extension workers who desire to use this type of educational procedure.

WRITING

Undergraduate

SEMINAR IN CREATIVE WRITING (III, 2 cr.)—Mr. Edward M. Barron; Thurs. from 5 to 7 commencing Feb. 6th.

The work in the seminar is devoted to journalistic and creative writing. Detailed analyses are made of trends and current forms of the trade and the feature article, the familiar essay, the short story, the novelette, and the novel as developed in modern publications. The primary concern is with the artistry of words, facility of expression, and the mechanics of the various forms. The student's inclinations in literary work are studied and he is encouraged to develop along the paths where his natural talents lie. The course presupposes a fundamental knowledge of composition and rhetoric.

Graduate and Advanced Undergraduate

MAGAZINE AND FEATURE WRITING (ADVANCED) (IV, V, 3 cr.)—Mr. Edwin W. Hullinger; Tues. from 5 to 7, Thurs. from 7 to 8 commencing Feb. 4th. Continuation of fall semester.

A continuation of the preceding course with more specialized attention to writing technique, market problems, etc.

Prerequisite: Magazine and feature writing or equivalent in professional experience.

WORLD NEWS AND ITS INTERPRETATION (IV, 2 cr.)—Mr. Edwin W. Hullinger; Thurs. from 5 to 7 commencing Feb. 6th.

A study of world news and its background, with reference to its treatment in editorials and feature articles. News gathering machinery will be examined and "big stories" traced to their origins as they appear on front pages. There will be round-table discussions of what lies behind present relations between world powers. Students will be given practice in writing interpretive articles and editorials on current situations as they develop.

WRITING ADMINISTRATIVE REPORTS, MEMORANDUMS, AND MANUALS (IV)—Mrs. Florence P. Marks. Available in 1941-42.

SPEECH

Undergraduate

FUNDAMENTALS OF SPEECH (I, 2 cr.)—Mrs. Hester Beall Provinsen; Tues. from 5 to 7 commencing Feb. 4th.

Elementary speech training, specific to individual needs, based upon diagnostic study of individual differences and abilities. Training embraces the development of distinct utterance, voice improvement and speech in every-day social and business relationships. Each student speaks at every class meeting receiving specific and constructive criticism. Stress is placed upon vocabulary building.

EFFECTIVE SPEAKING (II, 2 cr.)—Mrs. Hester Beall Provinsen; Thurs. from 5 to 7 commencing Feb. 6th.

The preparation and delivery of original speeches, speeches for special occasions, and the intelligent reading of script for radio presentation. Practice and criticism of extempore and impromptu speeches. Techniques for projection, modulation, and clarity of voice as speech situations require.

ORAL READING (II, 2 cr.)—Mrs. Sallie M. Pease; Tues. from 5 to 7 commencing Feb. 4th.

Much of the material that is presented to committees and other audiences involves more or less oral reading. Unless this is done in a clear, forceful manner, the effect is not what is desired. The best colleges and universities are now offering courses in oral reading to supplement courses in speech.

PERSUASIVE AND ARGUMENTATIVE SPEAKING (II, 2 cr.)—Dr. C. H. McReynolds; Mon. from 5 to 7 commencing Feb. 3d.

A course in speech, featuring psychology of the audience—kinds of audiences, fundamental interests, psychological mechanics, suggestion. Speech construction—the brief, the outline, evidence, authority, subjective vs. objective speeches, variety, humor. Speech delivery—personality, action, gesture, pause, kinds of emphasis, and contact with the audience. There are speeches, round table discussions, open forums, and debates. Every student speaks at every session.

PERSONAL DEVELOPMENT—Mrs. Hester Beall Provinsen; Wed. from 5 to 7 commencing Feb. 5th. (Non-credit course.) Fee \$12.

Discovery and development of the potentialities of each student. Poise, confidence, appearance, make-up, dress and color sense, art of conversation, cultivation of wider range of interest, of curiosity. Actual social situations created and discussed. Conferences, guest speakers.

SPEECH IMPROVEMENT (II, 2 cr.)—Mrs. Hester Beall Provinsen; Mon. from 5 to 7 commencing Feb. 3d.

A study of the voice. Production, diaphragmatic support, and enunciation to develop a rich, well modulated voice and distinct diction. Individual and group drills and exercises. Private conferences arranged for particular speech difficulties.

Graduate and Advanced Undergraduate

PREPARATION AND PRESENTATION OF PUBLIC ADDRESSES (IV, V, 2 cr.)—Dr. Knute E. Carlson; Fri. from 5 to 7 commencing Feb. 7th.

This course will give special attention to collection, organization, and logical presentation of subject matter with various definite objectives in view.

Prerequisite: Basic public speaking or its equivalent.

DRAMATIC SPEECH (IV)—Dr. C. H. McReynolds—(See LITERATURE AND DRAMA.)

FOREIGN LANGUAGES

The standard university language course is three semester hours. Those desiring the three semester credits in courses marked "2-3 cr." must so register in advance, paying \$18 per semester instead of \$12.

Courses marked I, II, are undergraduate, those marked III, IV, are advanced undergraduate or graduate.

ELEMENTARY FRENCH (I, II, 2-3 cr. each sem.)—Dr. Harry B. Humphrey; Mon. and Wed. from 5 to 6:30 commencing Feb. 3d. Continuation of fall semester.

Instruction in elements of French grammar. Reading and translation of elementary articles from selected texts. This course is designed to prepare beginners for the advanced course in French.

ADVANCED FRENCH (III, IV, 2-3 cr. each sem.)—Dr. Harry B. Humphrey; Tues. and Thurs. from 5 to 6:30 commencing Feb. 4th. Continuation of fall semester.

CONVERSATIONAL FRENCH—Miss Mary Sabarth; Wed. from 5 to 7 commencing Feb. 5th. Groups limited to 15. Non-credit. Fee \$12.

These classes are designed to give facility in conversation, use of idiom and correct pronunciation, development of vocabulary in social and business dealings. Students will meet in sections formed on the basis of background in French grammar.

ELEMENTARY GERMAN (I, II, 2-3 cr. each sem.)—Dr. C. H. Leineweber.

First semester. Wed. from 5 to 8 commencing Feb. 5th. A beginners' course.

Second semester. Mon. from 5 to 8 commencing Feb. 3d. Continuation of fall semester.

Instruction in elements of German grammar. Reading and translation of elementary articles from selected texts. This course is designed to prepare beginners for the advanced course in German.

ADVANCED AND TECHNICAL GERMAN (III, IV, 2-3 cr. each sem.)—Dr. C. H. Leineweber; Fri. from 5 to 8 commencing Jan. 31st. Continuation of fall semester.

GERMAN TRANSLATION (III, IV, 1½ cr. each sem.)—Mr. Ira T. Braunstein; Wed. from 5 to 6:30 commencing Feb. 5th. Fee \$9. Continuation of fall semester.

Prerequisites: German grammar and reading knowledge of German.

CONVERSATIONAL GERMAN—Miss Mary Sabarth; Tues. from 5 to 7 commencing Feb. 4th. Groups limited to 15. Non-credit. Fee \$12.

These classes are designed to give facility in conversation, use of idiom and correct pronunciation, development of vocabulary in social and business dealings. Students will meet in sections formed on the basis of background in German grammar.

ELEMENTARY ITALIAN (I, II, 2-3 cr. each sem.)—Dr. Nicholas G. Barbella; Tues. from 5 to 8 commencing Feb. 4th. Continuation of fall semester.

The fundamentals of the language, with practice in conversation. Texts: Joseph L. Russo, *Elementary Italian Grammar*; Marro, *Contemporary Italian Short Stories*.

ELEMENTARY RUSSIAN (I, II, 2-3 cr.)—Dr. C. H. Leineweber; Tues. from 5 to 8 commencing Feb. 4th.

ELEMENTARY SPANISH (I, II, 2-3 cr.)—Miss Ruberta M. Olds and Dr. T. Andersson; Tues. from 5 to 8 commencing Feb. 4th.

The aim of this course is to secure accuracy and facility in the use of the language by means of drill in pronunciation, grammar, conversation, and reading.

INTERMEDIATE SPANISH (I, II, 2-3 cr.)—Miss Ruberta M. Olds and Dr. T. Andersson; Mon. from 5 to 8 commencing Feb. 3d.

A continuation of the Elementary Spanish.

Prerequisite: Elementary Spanish or its equivalent.

SPANISH CONVERSATION AND COMPOSITION (II, III, 2-3 cr. each sem.)—Miss Ruberta M. Olds; Wed. from 5 to 8 commencing Feb. 5th. Continuation of fall semester.

An advanced course designed to develop ability to understand and to converse in idiomatic Spanish, to translate articles in newspapers and magazines, to compose and translate ordinary business and social letters, and to read for enjoyment.

Prerequisite: Intermediate Spanish or its equivalent.

THIRD-YEAR SPANISH AVAILABLE IN 1941-42.

INTRODUCTION TO SPANISH AMERICAN LITERATURE (See LITERATURE AND DRAMA).

LATIN AMERICA AND THE UNITED STATES, Lectures in Spanish (See POLITICAL SCIENCE).

ELEMENTARY PORTUGUESE (I, II, 2 cr.)—Mr. C. Herbert Cook; Mon. from 5:30 to 7:30 commencing Feb. 3d.

INTERMEDIATE PORTUGUESE (I, II, 2 cr.)—Mr. C. Herbert Cook; Wed. from 5:30 to 7:30 commencing Feb. 5th.

DEPARTMENT OF ENGINEERING AND MECHANICAL ARTS

ENGINEERING

Graduate and Advanced Undergraduate

NAVAL ARCHITECTURE (IV, 2 cr. each sem.)—Mr. Charles L. Wright, Jr.; Tues. from 5 to 7 commencing Feb. 4th. Continuation of fall semester.

Second semester. Trochoidal wave theory and rolling; speed and power of ships; steering.

SHIP CONSTRUCTION (IV, 2 cr. each sem.)—Mr. Charles L. Wright, Jr.; Thurs. from 5 to 7 commencing Feb. 6th. Continuation of fall semester.

Second semester. Design of deck fittings; arrangement plans; ventilation; wiring; piping; construction of deck houses; masts and rigging.

STRENGTH OF SHIPS (IV, V, 2 cr.)—Mr. T. L. Vose; Wed. from 6 to 8 commencing Feb. 5th.

General design methods; longitudinal strength; transverse strength; strength of plating; bulkheads; decks and platforms; foundations; fittings; connections and attachments; rudder and rudderposts, etc.

RADIO ENGINEERING (V)—Dr. L. P. Wheeler. Offered in alternate years; due again in 1941-42.

GLASS BLOWING

GLASS BLOWING (2 cr. each sem.) (A laboratory course for technicians)—Dr. Leland B. Clark; Mon. and Wed. at 4:50 commencing Mar. 3d, in the basement of the Smithsonian Institution. Fee \$18 per semester, including materials. Registration limited to ten students. Continuation of fall semester.

Simple manipulation of joining, bending, and shaping will be carried through to the production of useful apparatus. Metal in glass and glass to metal seals of all types will be made. During the first semester the soft glasses will be utilized for practice; during the second semester the related glasses will be used. Ample opportunity for advanced work will be given those who show themselves particularly adapted to the work.

GRAPHIC PRESENTATION

Undergraduate

These subjects have a two-fold purpose: First, training in graphic expression; second, developing draftsmen as designers and supervisors in the architectural and mechanical fields.

Prerequisites: Fifteen standard high school units or equivalent.

ARCHITECTURAL DRAWING (II, III, 2 cr. each sem.)—Mr. G. L. Edick; Tues. and Thurs. from 7 to 9 commencing Feb. 4th. Fee \$20 per semester. Continuation of fall semester. New students admitted.

Geometrical problems, orthographic projections, lettering, architectural symbols. Residence design, working drawings, details of construction, studies of modern methods of framing, and use of building materials.

MECHANICAL DRAWING (II, III, 2 cr. each sem.)—Mr. G. L. Edick; Tues. and Thurs. from 7 to 9 commencing Feb. 4th. Fee \$20 per semester. Continuation of fall semester. New students admitted.

Geometrical problems, orthographic projections, intersections and developments, lettering, and study of material symbols. Studies in machine shop practice, assembly and detail drawings, scale detail drawings from measured sketches by the student.

Advanced Undergraduate

FREEHAND DRAWING AND SKETCHING (III, IV, 2 cr.)—Miss Carrie C. Carte; Wed. and Fri. from 5 to 7 commencing Feb. 5th. Fee \$15.

A study of light and shadow, color and line. An intensive study of theory and harmony of color and composition from still life, and pictorial and outdoor sketching. The student may work with any medium such as pencil, colored pencil, charcoal, water colors, pastels, oils, etc. Each student will receive individual criticism. Open to both beginners and advanced students. Sketching only, two hours a week, on Fri. from 5 to 7; fee \$10. *Note:* No credit will be given to students working only on Fridays.

SHADES AND SHADOWS (III, IV, 2 cr.)—Miss Carrie C. Carte; Wed. and Fri. from 5 to 7 commencing Feb. 5th. Fee \$15.

An intensive study of the effect of the direction of light; problems in shades and shadows with relation to architectural forms and ornament. Each student will receive individual criticism. Open to both beginners and advanced students.

PERSPECTIVE DRAWING (III, IV, 2 cr.)—Miss Carrie C. Carte; Wed. and Fri. from 5 to 7 commencing Feb. 5th. Fee \$15.

Definitions and general theory of visual rays and study of perspective projection of an object on the picture plane. Problems representing, upon a plane surface, the appearance of objects as seen from some given point of view. Each student will receive individual criticism. Open to both beginners and advanced students.

COMMERCIAL DESIGN AND LAYOUT (III, IV, 2 cr.)—Mr. Paul Bissell; Thurs. from 5 to 7 commencing Feb. 6th. Fee \$12.

A laboratory course in design and production of layouts, visuals, pamphlets, booklets, posters, illustrations, movie titles, and exhibits. It will include criticism and direction in drawing and various art techniques which are in current use in the visual information field. It will also include detailed instruction in the preparation of art work, photographs, etc., for reproduction purposes, with discussions and practical demonstrations on the making of reproduction plates.

VISUAL INFORMATION (III, IV, 2 cr.)—Mr. Paul Bissell; Fri. from 5 to 7 commencing Feb. 7th. Fee \$12.

This course is designed to aid the information specialist in presenting his information to the public in the most forceful visual form consistent with the restrictions imposed by the practical necessities of the problem. It will include talks on proved methods used in determining the best mediums through which to reach the public with specified information. Instruction and criticism will be given on layout, lettering, posters, poster design, and commercial art illustration. A non-technical discussion of the various processes of reproduction and printing will be included. The advantages and limitations of the methods will be studied as well as the variance in costs. Methods of preparing "roughs," or "dummies," so that, though lacking artistic ability himself, he may be able to express his ideas in such visual form as to assure a satisfactory finished product from the workman, artist, engraver, or printer.

GRAPHIC CORRELATION—(See STATISTICS).

GRAPHIC METHODS APPLIED TO RESEARCH ANALYSIS—(See STATISTICS).

PHOTOGRAPHY

Advanced Undergraduate

BASIC PHOTOGRAPHY (III, IV, 2 cr.)—Mr. Carl H. Hanson and other specialists; Mon. and Wed. at 5 commencing Feb. 3d.

There are no prerequisites. The course will be elementary and basic in character and will be designed to meet the needs of the amateur. Text: Air Corps Training Manual No. 2170-5, "Basic Photography," for sale by the Superintendent of Documents—price 65 cents.

Elementary photographic optics, selection and use of photographic lenses, cameras and shutters, films and plates, the photography of colored objects, exposure, elementary photographic chemistry, preparing solutions, darkroom arrangement, conveniences and practices, developers and development, the technique of developing roll films, film packs and plates, the science of printing, the practice of printing, the camera in use, selection and arrangement of the subject, outdoor photography, enlarging papers, equipment and devices, how to make enlargements, finishing photographic prints, miniature camera photography, home portraiture, lighting and posing in portraiture, indoor photography, line work and copying, color photography, amateur motion picture cameras, equipment, and materials.

DEPARTMENT OF PUBLIC ADMINISTRATION

Graduate and Advanced Undergraduate

FINANCIAL ADMINISTRATION IN GOVERNMENT (IV, V, 2 cr.)—Dr. Joseph Pois; Wed. from 5 to 7 commencing Feb. 5th.

A series of 15 seminar discussion meetings designed to afford a general review of the various phases of financial administration. Subjects to be discussed will include financial organization; budgeting; governmental accounting; cost accounting; financial reporting; audit function; relationships between financial administration and other managerial functions; financial aspects of governmental corporations.

Prerequisite: Some experience in financial administration.

PERSONNEL CLASSIFICATION (III, IV, 2 cr.)—Mr. Robert S. Hare and Mr. Stanley Orear; Tues. and Fri. from 5 to 6 commencing March 4.

This is an introductory course designed to give the student an understanding of the fundamental concepts of position classification and its uses; the relation of classification to compensation and other phases of personnel administration; the historical background of position classification in the Federal Service; an analysis of the Classification Act of 1923 and its amendments and its relation to other personnel processes; position analysis and factors to be considered in the allocation of positions.

ADVANCED PERSONNEL CLASSIFICATION available in fall, 1941-42.

SUPERVISORY TRAINING (IV, V, 2 cr.)—Mr. Henry H. Farquhar and specialists; Fri. from 5 to 7 commencing Feb. 14th.

This course covers the importance, the principles, and the practices of sound supervision. Emphasis is placed upon the various ways in which supervisory relationships (or the structure of organization) may be arranged, with the consequent ease or difficulty of establishing clear lines of authority and of fixing individual accountability; the tangible and the intangible factors in leadership and morale building; supervisory control thru operating budgets and executive reports; guidance, training, and the handling of typical personnel problems including that of getting personnel "grievances," and constructive suggestions before the proper higher officials; planning work and dividing it up into specific jobs; making efficiency ratings and other measurements of employees and their work; and similar every-day aspects of the supervisor's duties. The course is conducted largely thru "round table" discussions; for this purpose each student is expected to turn in several of his own personal supervisory problems which, after reworking and disguising, are distributed for solution or comment by students with summary and conclusion by the instructor.

Where registration justifies the class will be divided into two groups (at least for some of the sessions): (a) Those with little supervisory experience, and (b) those with advanced experience.

SELECTION AND PLACEMENT (IV, 3 cr.)—Mr. Samuel S. Board;
Wed. from 5 to 8 commencing Feb. 5th.

Includes the study of recruiting, examination, and certification of employees of the federal government with special reference to comparable practices in private business and other government organizations. Placement activities carried on by the agencies themselves, such as interviewing, personnel inquiries, transfers, promotions, and the better use of probationary period.

COMPARATIVE ADMINISTRATIVE MANAGEMENT (IV, V, 2 cr.)—Dr. Richard A. Kahn; Mon. from 5 to 7 commencing Feb. 10th.

The course will deal with administrative management as practiced abroad; selection, training, classification, promotion and compensation of administrative officers and employees; budgetary and organizational problems and systems; and psychological and historical trends affecting public administration abroad. The object is to illuminate our own administrative problems by studying, comparatively, systems which have been or are being used abroad.

MUNICIPAL AND GOVERNMENTAL ACCOUNTING (IV, V, 3 cr.)—Mr. John B. Payne; Mon. from 5 to 8 commencing Feb. 3d.

A general survey of the scope and purpose of governmental accounting. The subjects discussed will include funds, classification of accounts, taxes, cash, and debt. Special attention will be given to financial reports. To the extent that time permits, reference will be made to Federal Accounting.

Prerequisites: One year of accounting or experience in fiscal administration.

AUDITING PROCEDURE—(See CLERICAL AND SECRETARIAL).

MAIL AND FILES PRACTICES—(See CLERICAL AND SECRETARIAL).

DEPARTMENT OF OFFICE SKILLS

CLERICAL AND SECRETARIAL

Undergraduate

GOVERNMENT CORRESPONDENCE (II, 2 cr.)—Mrs. Florence P. Marks; Tues. from 5 to 7 commencing Feb. 4th.

The writing of Government letters from the organization of subject matter to the language of the letter, paragraphing, construction of effective sentences, and correct usage. Vocabulary building. Methods for improving expression. Development and application of appraisal standards. Discussion of the problems involved in dictating and reviewing correspondence and supervising letter writers from the standpoint of the stenographer, dictator, reviewer, and supervisor.

AUDITING PROCEDURE (Government vouchers and related documents) (II, 2 cr. each sem.)—Mr. Carey G. Cruikshank; Wed. from 5 to 7 commencing Feb. 5th. Continuation of fall semester.

Second semester. Reimbursement, advertising, and adjustment vouchers; payrolls; collections.

MAIL AND FILES PRACTICES (II, 1½ cr.)—Messrs. John S. Lucas, Richard E. Kaufman, William Muller, and James R. Roads; Tues. from 5 to 6:30 commencing Feb. 4th. Fee \$9.

Mail and files procedures. The course will embrace instruction in the following subjects: filing and records; mail handling; telegrams; messenger service. Procedure in records units, embracing subject filing, classification techniques, briefing and cross indexing, sorting and preparation of material, folder and guide arrangement, retirement of material to inactive status, searching, tickler systems, arrangement of offices, equipment and filing materials.

ADVANCED SECRETARIAL TRAINING—Mrs. Alice Coffman; Tues. from 5 to 7 commencing Feb. 4th. Fee \$12.

Designed for those secretaries who would develop their duties, traits, and knowledge to qualify them for a higher degree of efficient service. The course will embrace instruction to assist the student in gaining a deeper insight into the principles of governmental secretarial work and their relation to office organization, help on problems of business etiquette and in meeting the demands of the vocation. Special stress will be laid upon the broader cultural aspects of the secretary's training, and upon the mastery of secretarial skills.

Prerequisites: Secretarial training (offered in the fall semester), or minimum CAF-4.

SHORTHAND DEVELOPMENT

70 to 110 WORDS PER MINUTE—Mrs. Alice Coffman; Mon. and Wed. from 5 to 6 commencing Feb. 3d. Class limited to 25. Fee \$12.

This course is designed for those who desire a review of theory in Gregg shorthand with dictation from 70 to 110 words a minute. Special attention will be given to the acquisition of a large vocabulary of Gregg outlines. Dictation will be graded from business letters and the Congressional Record; legal and technical matter relevant to the work in government offices.

100 to 150 WORDS PER MINUTE—Miss Clara E. Richter; Mon. and Wed. from 5 to 6 commencing Feb. 3d. Fee \$12.

This course is designed to develop recording speed in the more technical vocabularies. Subject matter will be selected and graded from the publications of the various bureaus in which members of the class are employed. Students must thoroughly familiarize themselves with the basic theory of the system of shorthand that they write prior to entering the class.

130 to 175 WORDS PER MINUTE—Miss Clara E. Richter; Mon. and Wed. from 6 to 7 commencing Feb. 3d. Fee \$12.

Continuation of the 100 to 150 word class with special emphasis on reporting technique.

175 WORDS PER MINUTE AND UP—Miss Clara E. Richter; Tues. and Thurs. from 5 to 6 commencing Feb. 4th. Fee \$12.

Dictation of legal and vocational matter with tests at five-word speed intervals.

INTERNATIONAL SHORTHAND—Mr. Fred Neter; Fri. from 5 to 7 commencing Feb. 7th. This is not the Gregg system. Fee \$12.

For beginners and advanced students who are interested in taking up shorthand in German, French, Dutch, Spanish, and Italian. Following this course there will be a regular interpreting course with training in the taking of testimony, etc., in shorthand in the languages mentioned above.

ADVANCED SHORTHAND IN SPANISH—Miss Grace M. Bauer; Tues. from 5:30 to 7:30 commencing Feb. 11th. Fee \$12.

Advanced dictation, including articles and business correspondence.
Prerequisite: Shorthand in Spanish.

1. PITMAN SHORTHAND SYSTEM—Dr. Louise C. Barry; Sat. from 1:30 to 3:30 commencing Feb. 1st. Fee \$12.

A comprehensive course in the principles of Pitman shorthand to enable technical, scientific, and professional students and workers to record research records, addresses and other work with greater speed, accuracy, and ease, and which embraces the necessary practical instruction to equip the student to write accurate Pitman shorthand.

2. PITMAN SHORTHAND SYSTEM—Dr. Louise C. Barry; Tues. and Thurs. from 5 to 6 commencing Feb. 4th. Fee \$12.

An advanced comprehensive course for Pitman writers, development of speed and accuracy, dictation of appropriate and illustrative material, standard word signs.

Prerequisites. Pitman shorthand (course 1) or equivalent knowledge of Pitman shorthand.

PITMAN REPORTING, 120 to 175—Dr. Louise C. Barry; Sat. from 3:30 to 4:30 commencing Feb. 1st. Fee \$15.

Emphasis upon phrases and reporting expedients. Practice exercises will be held Mon., Wed., and Fri. from 5 to 6.

Special courses in OFFICE SKILLS.

Given under the direction of Mr. Charles J. McDowell in the Farm Credit Administration, will be continued as needs of the service require. Information regarding these will be furnished by Mr. Milton Hall, Farm Credit Administration.

GENERAL LECTURES AND SPECIAL COURSES

THE CLASSICS (St. John's College Program)—Dr. George Leckie; Tues. from 7:30 to 9:30 commencing Jan. 28th. Limited to 25 students. Twelve-weeks course. Non-credit. Fee \$12.

The Graduate School, in cooperation with St. John's College of Annapolis, presents a series of seminar discussions on the great books. These discussions, based on books selected from the list of classics of the St. John's program will be led by members of the St. John's adult education staff, who are also members of the St. John's faculty. The books to be discussed in this series represent largely the great imaginative and speculative issues of the seventeenth and eighteenth centuries. The twelve meetings will cover:

1. Harvey, *On the Motion of the Heart*; 2. Hobbes, *Leviathan*, Part I; 3. Plato, *Republic*; 4. Plato, *Republic*; 5. Hobbes, *Leviathan*, Part II; 6. Boyle, *Skeptical Chymist*; 7. Locke, *Of Civil Government*; 8. Gilbert, *On the Magnet*; 9. Moliere; 10. Corneille; 11. Racine; 12. Aristotle, *Poetics*.

LECTURES—As in previous years special series of popular lectures will be given, probably a series on Latin American relations. Watch for special announcement.

PUBLICATIONS OF THE GRADUATE SCHOOL

	Price	Postage	
		U. S.	Foreign
ON LEAST SQUARES by W. Edwards Deming	\$1.50	3c	15c
ON THE STATISTICAL THEORY OF ERRORS by W. Edwards Deming and Raymond T. Birge	35c	1½c	4½c
ON THE STATISTICAL METHOD FROM THE VIEWPOINT OF QUALITY CONTROL by Walter A. Shewhart, edited by W. Edwards Deming	\$2.50	3c	12c
✓ FACSIMILES OF TWO PAPERS BY BAYES (his famous essay on probabili- ty, and a note on divergent series), with commentaries by E. C. Molina and W. Edwards Deming	\$1.00	3c	12c
ADMINISTRATIVE MANAGEMENT by outstanding leaders in that field			
paper binding	75c		
cloth binding	\$1.00	1½c	7½c
CURRENT ECONOMIC PROBLEMS by outstanding leaders in that field	50c	4½c	22½c
ELEMENTS OF PERSONNEL ADMINISTRATION by outstanding leaders in that field	50c	1½c	4½c
ADMINISTRATION Four lectures by outstanding leaders in the management field	25c	1½c	4½c
THE ADJUSTMENT OF PERSONALITY by outstanding leaders in that field	50c	3c	12c
Cheques accepted; U. S. and British stamps accepted.			

CUT HERE

DEPARTMENT OF AGRICULTURE GRADUATE SCHOOL

REGISTRATION FORM

Persons who are ready to register for any of the courses listed are urged to fill out the following form. For courses offered in the Spring semester, mail or present in person prior to January 24. Room assignments are made on the basis of registrations made up through the dates mentioned above; late-comers often necessitate readjustments and create extra overhead, as well as inconvenience to those who have already registered and received their room assignments.

To: Dr. A. F. Woods, Director

The Graduate School, Department of Agriculture, Room 1031
Washington, D. C.

I should like to register for the following courses:

This MUST be filled out IN FULL.

Educational background:

High School _____ Date _____

College _____ Date _____

Degrees _____

(Over)

A cheque for \$_____ is enclosed. (The tuition will be \$12 a semester for two hour a week studies and \$18 a semester for three hour a week studies, except as otherwise indicated. Those who desire college or graduate credits certified to a university or to the Civil Service Commission will pay \$7.50 a credit hour instead of \$6.00 a credit hour.)

Name (Please write or print plainly)

Residence_____Telephone_____

Present position_____Telephone_____

Where employed_____

Do you intend to meet all credit requirements and receive a class grade?_____

Were you enrolled in the Graduate School last semester?_____

(A registration card, constituting a receipt, will be mailed to you before classes commence.)

(Over)